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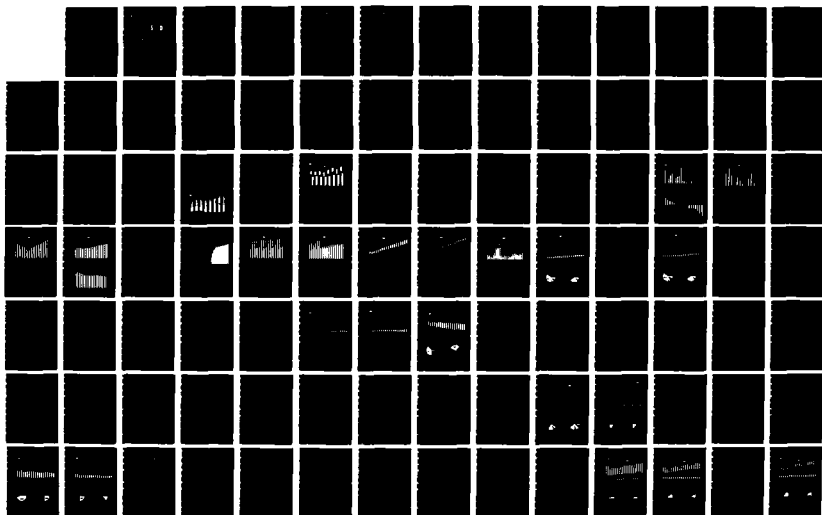
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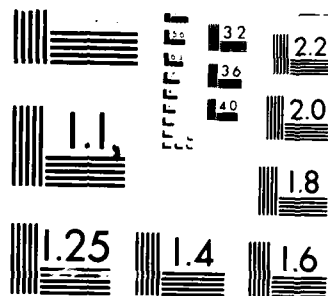
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U.S. Department
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February 1987

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FORECASTS

Fiscal Years 1987 - 1998

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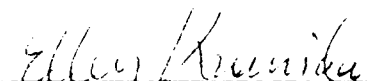
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16. Abstract This report contains the Fiscal Years 1987-1998 Federal Aviation Administration (FAA) forecasts of aviation activity at FAA facilities. These include airports with FAA control towers, air route traffic control centers, and flight service stations. Detailed forecasts were made for the four major users of the national aviation system: air carriers, air taxi/commuters, general aviation and the military. The forecasts have been prepared to meet the budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, by the aviation industry, and by the general public. The overall outlook for the forecast period is for strong economic growth, rising real fuel prices, and moderate inflation. Based upon these assumptions, aviation activity is forecast to increase by Fiscal Year 1998 by 34 percent at towered airports (commuters, 58 percent; air carriers, 33 percent; general aviation, 33 percent; military, 0 percent); 34 percent at air route traffic control centers (commuters, 82 percent; air carriers, 31 percent; general aviation, 31 percent; military, 0 percent), and 22 percent in flight services performed. Hours flown by general aviation is forecast to increase 9 percent, and helicopter hours flown, 50 percent. Scheduled domestic revenue passenger miles (RPM's) are forecast to increase 77 percent, with scheduled international RPM's forecast to increase by 80 percent. Regionals/commuters RPM's forecast to increase by 165 percent.			
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PREFACE

The Federal Aviation Administration forecasts of aviation activity and other selected statistics are developed annually for use in the agency's planning and decisionmaking. Aviation activity under the control of FAA towered airports and Air Route Traffic Control Centers and the services provided by the Flight Service Stations are forecast for the several user groups--commercial air carriers, commuters/air taxis, general aviation, and the military.

For the period 1987-92, FAA aviation forecasts utilized projections of key economic variables provided by the Executive Office of the President, Office of Management and Budget. For the period 1993-98, FAA aviation forecasts were based on consensus growth rates of key economic variables provided by Chase Econometrics, Data Resources, Inc., Evans Economics, Inc., and Wharton Econometric Forecasting Associates. These projections are combined with projections of aviation variables and professional judgment on the probabilities and consequences of events that affect aviation. The combination is used as input to the econometric models from which the forecasts are generated.

The forecasts developed by these models and presented in this report indicate a continuation of strong growth for commercial operations. However, due to an 8-year slump in the general aviation manufacturing industry and expected low levels of production for the next few years, the forecasts for this segment of the industry have been significantly lowered. The projected system demand was not specifically constrained as a result of capacity problems at some major U.S. air terminals. We recognize, however, that scenarios may evolve which could result in some constraints being placed on the system. Of special concern are the indications that the number of general aviation airports may be declining at an accelerating rate. The importance of these airports for feeding the system with both passengers and embryo pilots cannot be overlooked. Also, there is the uncertain impact of growing constraints on the construction of new runways and major new airports because of increased community resistance to aircraft noise. In order for the forecasts of this report to be realized, noise impact and the resultant restrictions on capacity and system growth must be dealt with at an early date. The forecasts assume that these threats to orderly growth are manageable and that there would be only minor perturbations to the long-term growth expected for the industry.


Ellen Kranidas
Director of Aviation Policy and Plans



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Chapter I

Executive Summary

In the fall of 1978, Congress deregulated commercial aviation, arguing that the airlines had matured and no longer required the protection offered by regulation. With the passage of the Deregulation Act of 1978, three expectations were widely held: there would be improved service to the flying public; fares would be lower; and airlines would achieve higher profits. The effects of deregulation were felt almost immediately. Airlines, testing their new freedoms, increased fares on some routes and decreased them on others. They entered numerous new markets and withdrew from a number of smaller, low-density markets. New carriers filed for certification, and new marketing strategies evolved as the airlines' managements attempted to structure their route networks for survival in the new, highly competitive environment. The results of deregulation are mixed. Some fares are lower, some services have improved, and some carriers are more profitable after deregulation. Recent trends in the industry, however, indicate that a significant concentration of traffic and profits by a few large carriers seem to be evolving. In spite of this consolidation, the commercial aviation industry of the future may be vigorous, competitive, and profitable.

The evolution of the industry to date has had a significant impact on FAA workload and facility planning. The rapid development of connecting hub airports and an increased airline emphasis on schedule frequency to attract and control traffic have made airport capacity problems a major challenge for the FAA in accomplishing its statutory mission. This mission is "service to the Nation by providing a safe and efficient aviation system which contributes to national security and the promotion of U.S. aviation." With the long-term outlook being one of continued strong growth, the industry and the FAA must work together to meet the challenges of this increased demand to ensure that the public gets the aviation services that it needs--safely and efficiently.

REVIEW OF 1986

Fiscal 1986 was a year of significant structural changes in the aviation industry. The commercial carriers experienced a number of mergers which has resulted in the creation of what have been labeled "mega-carriers." However, general aviation aircraft shipments declined for an eighth consecutive year, causing concern for the future of the industry. In spite of a continued softness in general aviation operations, traffic increased as forecast at FAA towers and at enroute traffic control centers.

At the end of fiscal 1986, there were 46 commercial air carriers engaged in scheduled air service, 16 more than had existed prior to deregulation, but 11 fewer than had been in operation one year earlier. The combined traffic of the four largest carriers (post 1986 merger activity) accounted for 59.8 percent of the total industry traffic in 1986, nearly 7 points higher than the four largest carriers achieved in 1977. These results suggest significant control of traffic among a few mega-carriers.

Scheduled domestic passenger traffic increased 10.7 percent in fiscal 1986. However, despite a 20.8 percent decline in jet fuel prices, which reduced operating expenses by more than \$2.2 billion, the industry posted an operating profit of only \$591 million. This represented a \$1.4 billion decline from fiscal 1985 results.

General aviation aircraft shipments in fiscal 1986 totaled 1,514 units, down 32 percent below the 2,226 units shipped in 1985. Total pilots declined 1.8 percent to 709,540 as of January 1, 1986. Ultimately, the shrinking stock of pilots and the slowing in the expansion of the general aviation fleet will reduce the rate of growth of activity at FAA facilities.

Air carrier activity at FAA towers increased by 8.9 percent in fiscal 1986. General aviation and commuter/air taxi operations declined slightly during the same time period. Total instrument operations at towers grew 4.4 percent, and center aircraft handled increased 4.3 percent during fiscal 1986, continuing the strong recovery which began following the air traffic controller strike.

The impacts of deregulation are continuing to alter the commercial aviation industry. The long expected recovery of the general aviation manufacturing industry has not materialized, but activity measured at FAA facilities continues to exhibit moderate to strong growth.

ECONOMIC FORECASTS

The forecasts are based on improved models of general aviation and air carrier activities and on forecasts of economic variables as contained in the table below.

FAA FORECAST ECONOMIC ASSUMPTIONS FISCAL YEARS 1987 - 1998

ECONOMIC VARIABLE	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1980	1985	1986	1987	1988	1998	80-86	85-86	86-87	87-88	86-98
Gross National Product (Billions 1982\$)	3,187.7	3,559.7	3,656.7	3,764.0	3,892.5	5,263.8	2.3	2.7	2.9	3.4	3.1
Consumer Price Index (1967 = 100)	239.8	315.9	322.7	330.0	342.2	517.2	5.1	2.2	2.3	3.7	4.0
Oil & Gas Deflator (1982 = 100)	90.4	95.5	82.6	79.2	89.6	166.3	(1.5)	(13.5)	(4.1)	13.1	6.0

Source: 1987-92 Executive Office of the President, Office of Management and Budget

1993-98 Consensus growth rate of Chase Econometrics, Data Resources, Inc., Evans Economics, Inc., and Wharton Econometric Forecasting Associates.

The overall outlook for the forecast period is for strong economic growth, increasing real fuel prices, and moderate inflation. Reflecting the strong U.S. economy, aviation activity is expected to exhibit relatively strong growth throughout the forecast period. This growth is consistent with forecasted long-term economic growth. It should be recognized that in any given year there may be some perturbation from the long-term growth trend because none of the economic models is sufficiently precise to predict such turning points.

AVIATION ACTIVITY FORECASTS

Domestic air carrier revenue passenger miles are forecast to increase at an annual growth rate of 4.9 percent during the 1986-1998 time period. Domestic enplanements are forecast to increase by 4.5 percent annually during the same time period, a rate somewhat slower than passenger mile growth due to longer passenger trip lengths. Air carrier aircraft operations are forecast to increase at an annual rate of 2.4 percent over the forecast period. The high growth in revenue passenger miles and enplanements relative to operations reflects the baseline air carrier assumptions of higher load factors, larger seating capacity for air carrier aircraft, and longer passenger trip lengths.

In 1987, the regionals/commuters are expected to enplane 28.3 million passengers, 6.6 percent of all fare-paying passengers in scheduled domestic air service. By 1998, these carriers are expected to carry 56.9 million passengers and to account for 8.2 percent of all domestic passenger enplanements. Regionals/commuters are expected to continue the trend toward purchase of small jet aircraft and larger, propeller-driven aircraft.

Nationally, commuter/air taxi aircraft operations are expected to continue to increase at a faster rate than the other user categories--but not at the rates of the last several years. Replacement service in markets abandoned by the larger commercial air carriers has almost run its course as a significant source of growth for the regionals/commuters. Future growth is expected to come from growth in existing markets and, to some degree, from the development of new markets in smaller communities which show potential for supporting regularly scheduled service.

Increased business use of general aviation continues to be reflected in the changing character of the fleet. The more expensive and sophisticated turbine-powered part of the fixed wing fleet is expected to grow much faster than piston aircraft between 1986 and 1998. The total fleet, 78.1 percent single engine piston aircraft in 1986, will grow by only 4.2 percent during the forecast period. Fixed wing turbine-powered aircraft accounted for 4.7 percent of the fleet in 1986. By 1998, the percentage will increase to 6.7 percent.

FAA WORKLOAD FORECASTS

Aviation activity at FAA facilities is expected to continue the upward growth pattern which began in 1983. The demand for FAA operational services is anticipated to increase over the forecast period as a result of continued strong growth in aviation activity. Total aircraft operations at FAA towered airports are forecast to increase to 79.0 million in 1998, a 2.5 percent annual growth rate over the 58.9 million operations achieved in 1986.

AVIATION ACTIVITY FORECASTS

FISCAL YEARS 1987 - 1998

AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1980	1985	1986	1987	1988	1998	80-86	85-86	86-87	87-88	86-98
<u>AIR CARRIER</u>											
<u>Enplanements (Mil)</u>											
Domestic	278.2	350.4	385.0	407.1	430.9	654.2	5.6	9.9	5.7	5.9	4.5
International	24.1	24.6	24.6	25.5	26.9	42.6	0.3	0.0	3.7	5.5	4.7
<u>RPM's (Bil)</u>											
Domestic	203.2	265.8	294.3	311.4	330.5	520.1	6.4	10.7	5.8	6.1	4.9
International	54.2	64.8	64.1	66.7	70.5	115.2	2.8	(1.1)	4.1	5.7	5.0
<u>COMMUTERS/REGIONALS</u>											
Enplanements (Mil)	13.9	24.4	26.1	28.3	30.4	56.9	11.1	7.0	8.4	7.4	6.7
RPM's (Bil)	1.8	3.8	4.2	4.6	5.1	10.9	15.2	9.4	10.5	10.2	8.3
<u>FLEET</u>											
Air Carrier	2,394	2,938	3,168	3,278	3,423	4,159	4.8	7.8	3.5	4.4	2.3
Commuter	1,413	1,551	1,538	1,501	1,557	2,087	1.4	(0.8)	(2.4)	3.7	2.6
General Aviation (000)	210.3	220.9	210.7	210.4	209.6	219.3	0.0	(4.6)	(0.1)	(0.4)	0.3
<u>HOURS FLOWN (Mil)</u>											
Air Carrier	6.5	7.7	8.5	9.0	9.5	12.3	4.6	10.4	5.9	5.6	3.1
General Aviation	41.9	36.2	33.8	33.9	33.7	36.8	(3.6)	(6.6)	0.3	(0.6)	0.7

Source: 1980-86 RSPA, FAA DATA

1987-98 FAA Forecast

FAA WORKLOAD MEASURES
FISCAL YEARS 1987 - 1998

WORKLOAD MEASURES (IN MILLIONS)	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1980	1985	1986	1987	1988	1998	80-86	85-86	86-87	87-88	86-98
<u>Aircraft Operations</u>											
Air Carrier	10.1	11.3	12.3	12.8	13.3	16.3	3.3	8.9	4.1	3.9	2.4
Air Taxi & Commuter	4.6	6.9	6.9	7.3	7.7	10.9	7.0	0.0	5.8	5.5	3.9
General Aviation	49.0	37.2	37.0	37.7	38.6	49.1	(4.8)	(0.5)	1.9	2.4	2.4
Military	<u>2.5</u>	<u>2.5</u>	<u>2.7</u>	<u>2.7</u>	<u>2.7</u>	<u>2.7</u>	<u>1.3</u>	<u>8.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
TOTAL	66.2	57.9	58.9	60.5	62.3	79.0	(2.0)	1.7	2.7	3.0	2.5
<u>Instrument Operations</u>											
Air Carrier	10.6	11.8	12.7	13.2	13.7	16.7	3.1	7.6	3.9	3.8	2.3
Air Taxi & Commuter	4.1	6.4	6.6	7.0	7.4	10.6	8.3	3.1	6.1	5.7	4.0
General Aviation	19.3	16.4	16.8	17.2	17.6	22.2	(2.3)	2.4	2.4	2.3	2.4
Military	<u>4.1</u>	<u>4.1</u>	<u>4.3</u>	<u>4.3</u>	<u>4.3</u>	<u>4.3</u>	<u>0.8</u>	<u>4.9</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
TOTAL	38.2	38.7	40.4	41.7	43.0	53.8	0.9	4.4	3.2	3.1	2.4
<u>IFR Aircraft Handled</u>											
Air Carrier	13.9	14.6	16.0	16.6	17.2	20.9	2.4	9.6	3.8	3.6	2.3
Air Taxi & Commuter	2.6	4.8	5.0	5.4	5.8	9.1	11.5	4.2	8.0	7.4	5.1
General Aviation	8.9	8.3	8.0	8.3	8.5	10.5	(1.8)	(3.6)	3.8	2.4	2.3
Military	<u>4.7</u>	<u>5.0</u>	<u>5.1</u>	<u>5.1</u>	<u>5.1</u>	<u>5.1</u>	<u>1.4</u>	<u>2.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
TOTAL	30.1	32.7	34.1	35.4	36.6	45.6	2.1	4.3	3.8	3.4	2.5
<u>Flight Services</u>											
Pilot Briefs	18.3	14.6	13.4	13.0	12.8	14.4	(5.3)	(8.2)	(3.0)	(1.5)	0.6
Flight Plans Originated	9.0	8.0	7.5	7.4	7.5	9.4	(3.1)	(6.2)	(1.3)	1.4	1.9
Aircraft Contacted	<u>9.6</u>	<u>7.7</u>	<u>7.2</u>	<u>7.0</u>	<u>7.0</u>	<u>7.5</u>	<u>(4.9)</u>	<u>(6.5)</u>	<u>(2.8)</u>	<u>0.0</u>	<u>0.3</u>
TOTAL	64.2	52.9	49.0	47.8	47.6	55.1	(4.6)	(7.4)	(2.5)	(0.4)	1.0

Source: FY 1980-86 FAA Data

FY 1987-98 FAA Forecasts

The increased use of avionics by regionals/commuters and general aviation is expected to contribute most of the growth in instrument operations at FAA towered airports. Instrument operations are forecast to increase from 40.4 million operations in 1986 to 53.8 million in 1998, a 2.4 percent annual growth rate.

The workload at the Air Route Traffic Control Centers is forecast to increase at a 2.5 percent average annual rate between 1986 and 1998. The increased demand will come primarily from commercial air carriers and regionals/commuters. Regional/commuter aircraft handled at the Centers are projected to almost double over the next 12 years.

In summary, aviation activity is expected to continue the upturn begun in fiscal 1983 and to grow at about the same rate as the general economy. Aviation will continue to dominate all other transportation modes in the commercial intercity passenger market. Regional/commuter aircraft activity and the business use of general aviation are expected to experience greater growth than the larger, established airlines and personal use of general aviation.

Chapter II

Economic Environment

REVIEW OF 1986

The current economic expansion, which began in 1983, is comparable to some of the most robust recoveries of the post-war period. This recovery has been characterized by a favorable mix of rising output, declining inflation, and falling energy prices. In fiscal 1986, the fourth full year of economic expansion, gross national product (GNP) rose \$226 billion or 5.7 percent. Gross national product, adjusted for price changes, rose 2.7 percent. Consumer prices continue to increase at relatively low rates, which indicates that inflation is well under control. The consumer price index for all urban consumers rose only 2.2 percent in fiscal 1986. Increasing supplies of oil, accompanied by reduced demand due to conservation and the development of alternative sources of energy, continue to exert downward pressure on fuel prices. The oil and gas deflator declined 0.4 percent in fiscal 1985 and 13.5 percent in fiscal 1986.

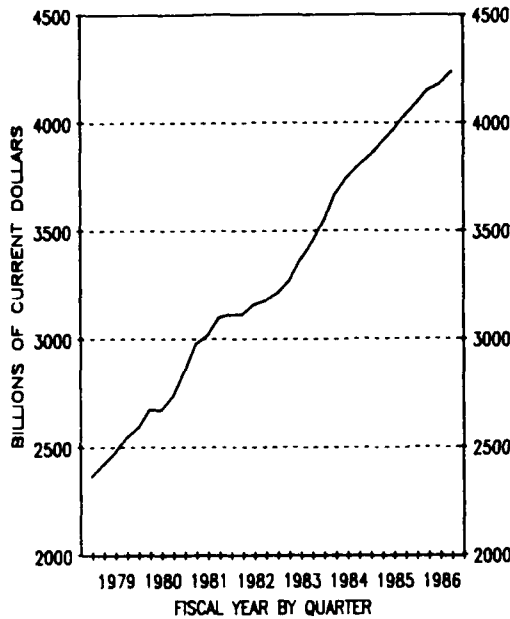
Economic growth should continue through 1987. Inflation is expected to remain in the moderate range as fuel prices continue to fall. Declining fuel prices, low inflation rates, and an expanding economy will all contribute to a continuation of the upturn in aviation activity begun in 1983.

FORECAST ASSUMPTIONS

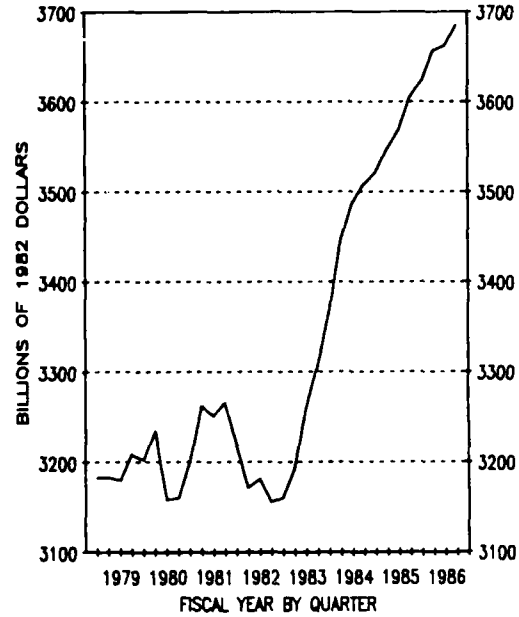
The economic scenario utilized in developing the FAA Baseline Aviation Forecasts for the period 1987-1992 was provided by the Executive Office of the President, Office of Management and Budget. For the period 1993-98, the economic scenario utilized consensus growth rates of the economic variables prepared by Chase Econometrics, Data Resources, Inc., Evans Economics, Inc., and Wharton Econometric Forecasting Associates. The data are presented in tabular form in Chapter IX. The principal series used in preparing the forecasts are presented here. Specific assumptions used in the individual models are discussed in the following pages.

ECONOMIC TRENDS

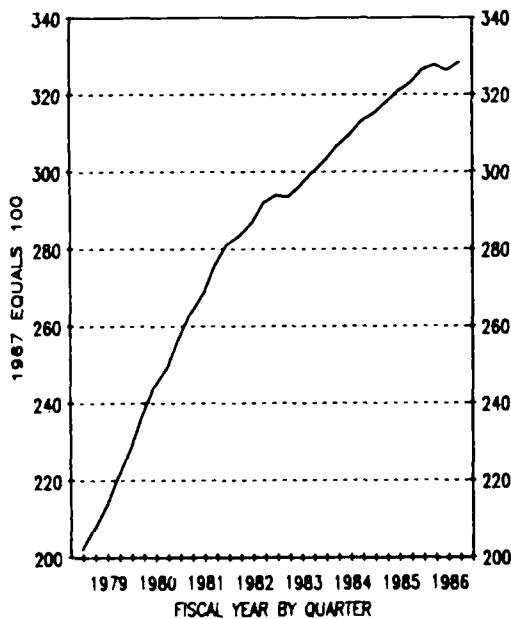
NOMINAL GNP



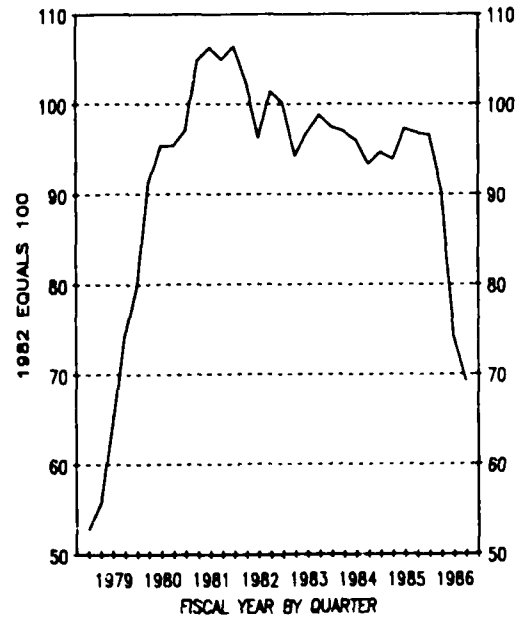
'REAL' GNP



CONSUMER PRICE INDEX



OIL AND GAS DEFLATOR



ECONOMIC FORECASTS

Gross National Product

Gross national product, adjusted for price changes, is expected to grow at an annual rate of 3.1 percent throughout the forecast period. However, much of this growth occurs in the short-term, with real gross national product increasing by 2.9 percent in 1987, 3.4 percent in 1988, and averaging 3.4 percent between 1987 and 1992. Economic growth is expected to slow somewhat during the latter half of the forecast period, averaging only 2.7 percent over the 1993 to 1998 time frame.

Consumer Price Index

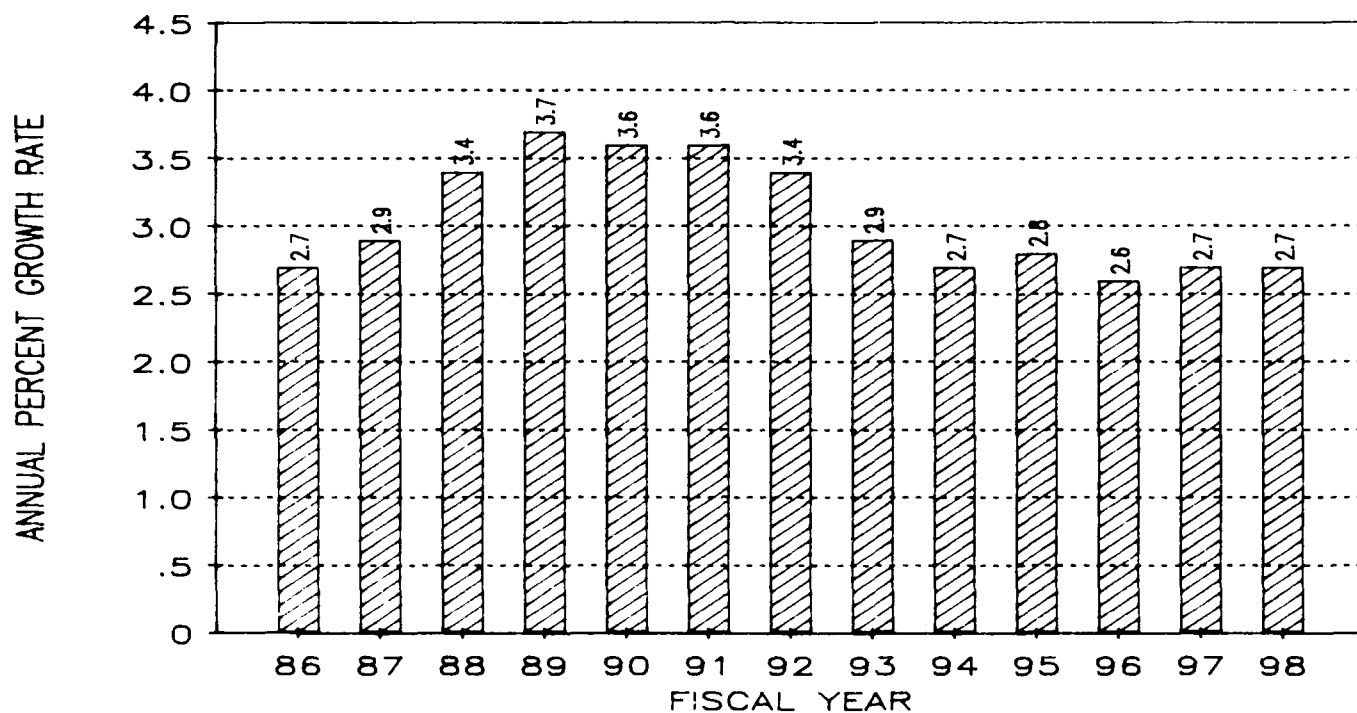
Consumer prices are expected to remain in the moderate range, increasing by an average annual rate of 4.0 percent over the forecast period. Inflation is forecast to increase by only 2.3 percent in 1987, 3.7 percent in 1988, and average only 3.0 percent per year over the first six years of the forecast period. However, inflation is expected to increase to an annual rate of 5.0 percent over the latter half of the forecast period.

Oil and Gas Deflator

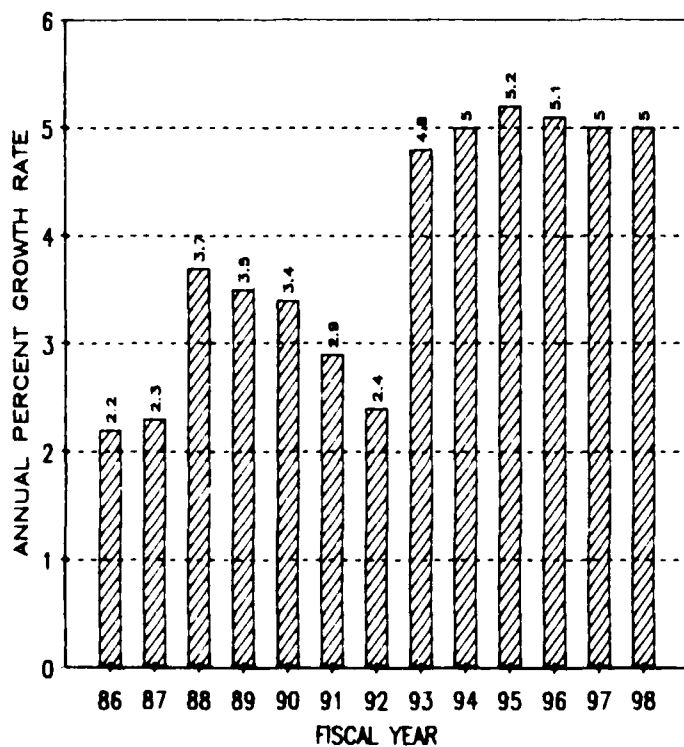
Over the entire forecast period, nominal fuel prices are predicted to increase at an annual rate of 6.0 percent, and real fuel prices are expected to increase by approximately 2.0 percent a year. However, most of the increase occurs during the first half of the forecast period. After declining by 4.0 percent in 1987, fuel prices are forecast to increase by 13.1 percent in 1988 and 9.6 percent in 1989. Over the first six years of the forecast period, nominal fuel prices are forecast to increase at an annual rate of 6.5 percent, while real fuel prices are expected to increase 3.5 percent a year. The increase in fuel prices are expected to slow somewhat over the 1993 to 1998 time period. During this time frame, nominal fuel prices increase at an annual rate of 5.5 percent, while real fuel prices increase at a yearly rate of only 0.5 percent.

FORECASTS OF ECONOMIC VARIABLES

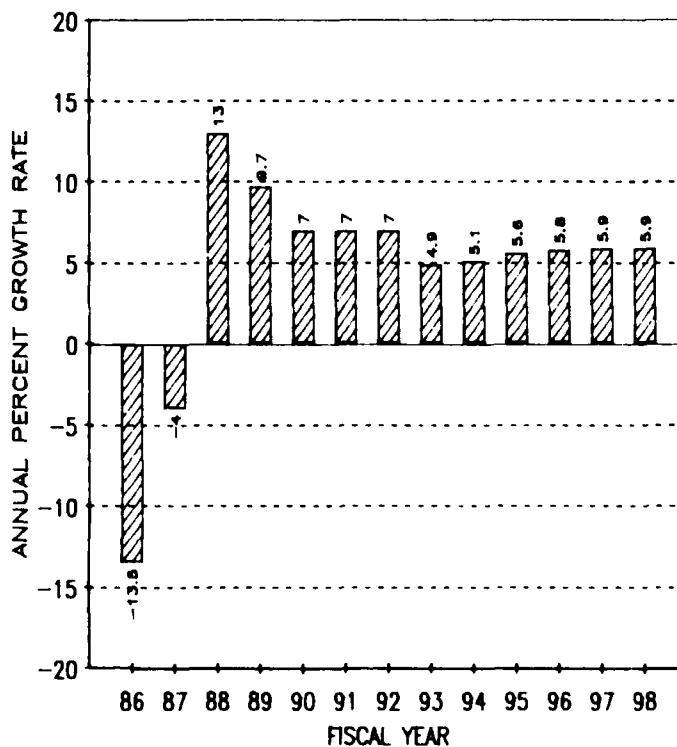
GROSS NATIONAL PRODUCT (1982 DOLLARS)



CONSUMER PRICE INDEX (1967 = 100)



OIL AND GAS DEFLATOR (1982 = 100)



Chapter III

Commercial Air Carriers

As of December 1986, there were approximately 76 commercial passenger and cargo air carriers reporting traffic and financial data on Form 41 to the Research and Special Programs Administration (RSPA), Department of Transportation. Of this total, 46 were engaged in providing scheduled passenger air service, and these represent the data base on which the air carrier forecasts contained herein are formulated. A listing of active and inactive commercial passenger and cargo airlines can be found in Appendices A and B, beginning on page 165.

REVIEW OF 1986

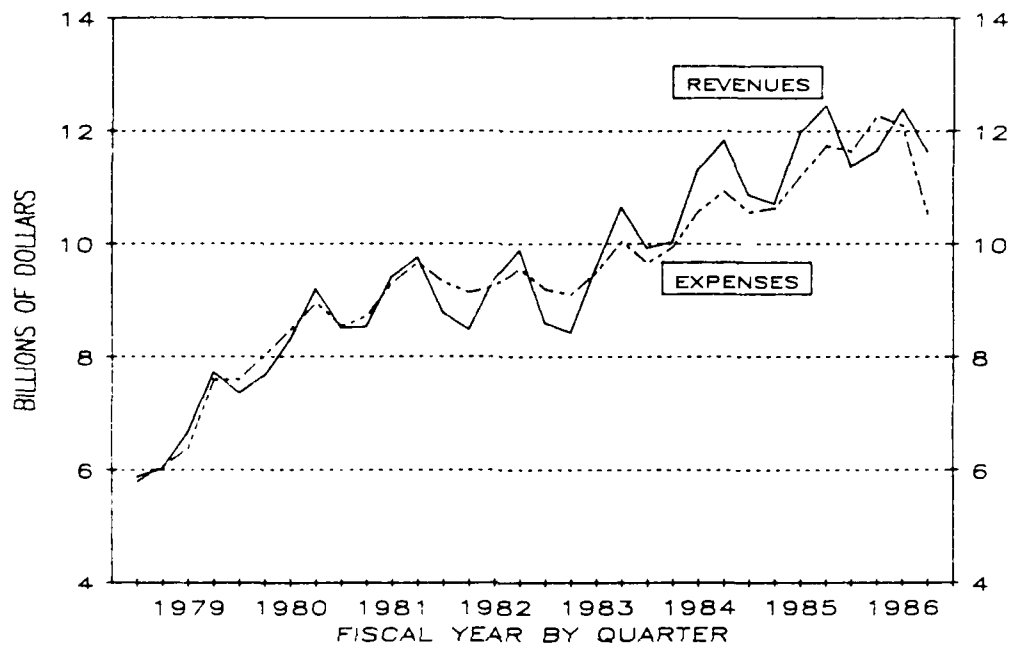
Financial Results

Financially, fiscal 1986 was a year of extremes for U.S. commercial air carriers, not only in terms of industry profits and losses, but also in terms of individual carrier results. In the two prior years, U.S. commercial air carriers recorded operating profits totaling more than \$4 billion and net profits of over \$1.7 billion. However, during the first six months of fiscal 1986, the industry incurred an operating loss of \$854 million and a net loss of \$713 million. These losses were largely the result of a proliferation of fare wars on most competitive routes. Although the fare wars continued throughout the remainder of the year, the industry, fortunately, was the beneficiary of a 36.4 percent decline in jet fuel prices during the last six months of the year. This allowed the industry to reverse the first half loss and post an operating profit of \$591 million in 1986.

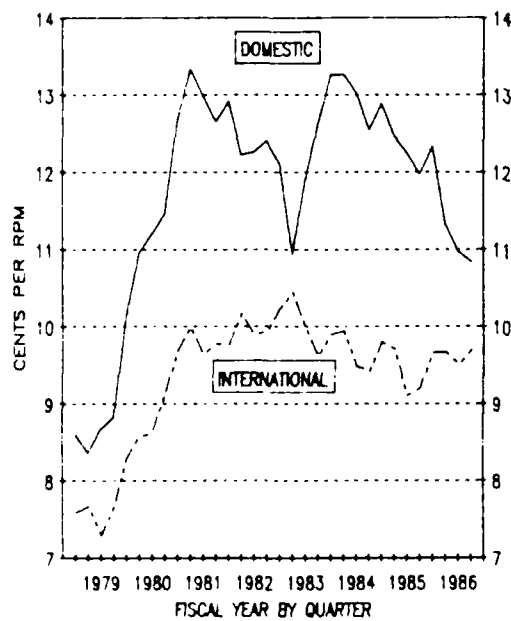
The industry's financial turnaround in the second half of the year was the direct result of declining fuel prices. In the third quarter, declining fuel costs reduced operating expenses by \$850 million, and the industry posted an operating profit of \$311 million. In the fourth quarter, declining jet fuel costs reduced operating expenses by almost \$1.2 billion, and the industry earned operating profits of \$1.1 billion. For the year as a whole, a 20.8 percent reduction in the price of jet fuel saved U.S. commercial carriers over \$2.2 billion. The fuel cost savings were not enough, however, to overcome the interest payments on the industry's large debt structure, with the result that the industry posted a net loss of \$223 million in 1986.

U.S. AIR CARRIER REVENUE AND COST TRENDS

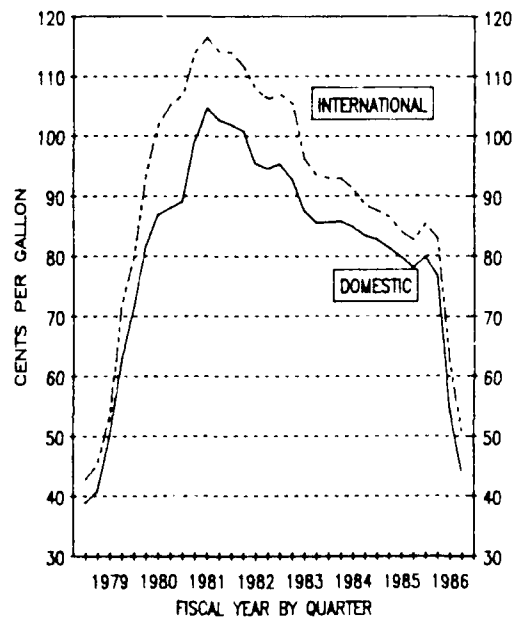
OPERATING REVENUES AND EXPENSES



PASSENGER YIELDS



JET FUEL PRICES



The disparity among individual carrier financial results widened considerably over the past year. In fiscal 1986, air carrier financial results ranged from American Airline's operating profit of \$304 million to Pan American's operating loss of \$296 million. At the top (profitable) end of the scale, eight carriers reported operating profits totaling \$1.3 billion. At the bottom end of the scale, 27 carriers reported operating losses totaling \$954 million. However, six carriers accounted for \$804 million of these losses. In addition, 18 carriers either filed for bankruptcy, ceased operations, or both during fiscal 1986.

Although lower jet fuel prices have helped to ease the pressure on those carriers with weak balance sheets, there is continued cause for concern within the industry. Lower fuel costs appear to offer only a temporary respite for both the weaker and more profitable carriers alike. Also, continued weak energy prices could prolong the fare wars that were so prevalent over the past year. Even if the current round of fare wars were to end, there is likely to be continued pressure to hold fare increases to an absolute minimum. In addition, the recent mergers/consolidations have not only strengthened the route systems of a few large carriers, but have also placed these larger carriers in a position of financial strength. This, in turn, has left the smaller carriers in relatively weak positions in competing against these larger carriers. Those carriers who are unable to establish a market niche for themselves or, at the very least, to find a compatible merger partner, may very well cease to exist as viable air carriers. Whether this bodes well for the industry, as a whole, or for the traveling public, in general, is a question that will be answered only over time.

Scheduled Domestic Passenger Traffic and Capacity

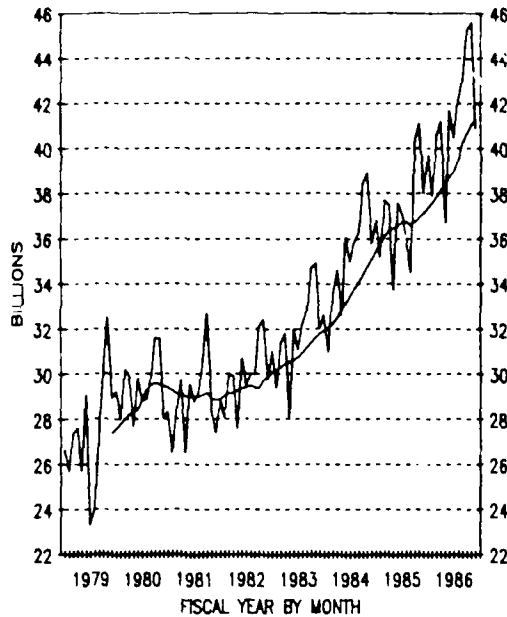
Despite a slowing in U.S. economic activity over the past year, domestic passenger traffic on U.S. scheduled commercial air carriers increased for a fifth consecutive year. Domestic revenue passenger miles (RPM's) totaled 294.3 billion in fiscal 1986, a 10.7 percent increase over 1985 and the second successive year of double digit growth. Domestic passenger enplanements totaled 385.0 million in 1986, an increase of 9.9 percent over 1985 and an increase of 22.9 percent over the past two years. Declining passenger yields and a shift from European summer destinations were two of the main reasons for the large increase in domestic passenger demand in 1986.

Domestic available seat miles (ASM's) flown by U.S. scheduled air carriers totaled 488.3 billion in fiscal 1986, an increase of 11.8 percent over 1985. This large increase was, for the most part, due to increased hubbing activity at major U.S. airports. Two other reasons for the large increase include capacity shifts from European markets to domestic service and the fact that United and Pan American were on strike for a total of 55 days in 1985. Since traffic failed to keep pace with the increased capacity, the domestic load factor declined by 2.6 points in 1986 to 60.3 percent.

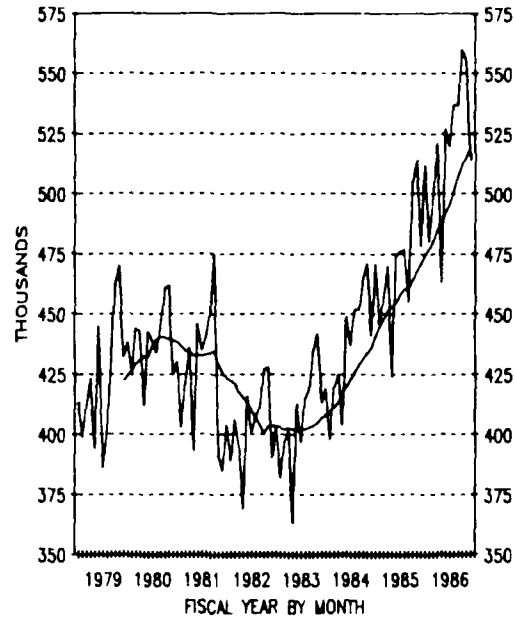
U.S. AIR CARRIER CAPACITY AND TRAFFIC TRENDS

DOMESTIC OPERATIONS

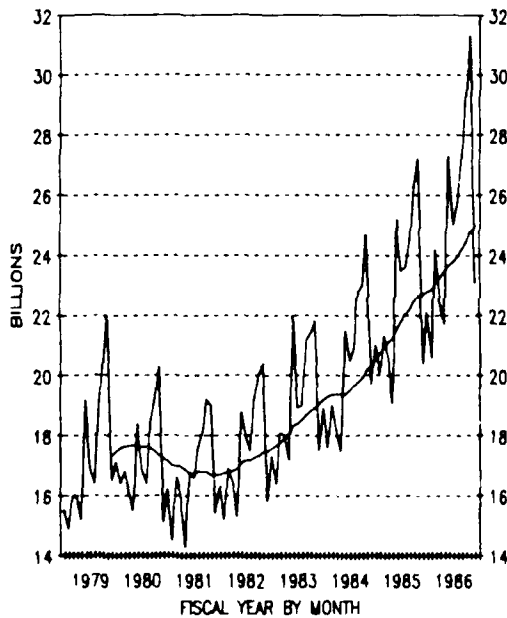
AVAILABLE SEAT MILES



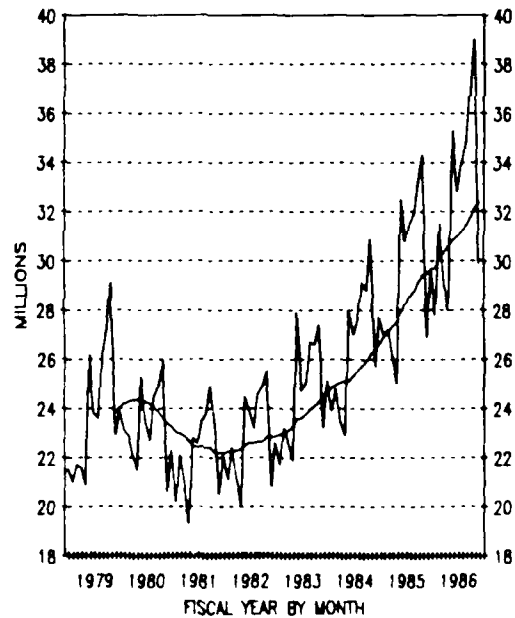
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



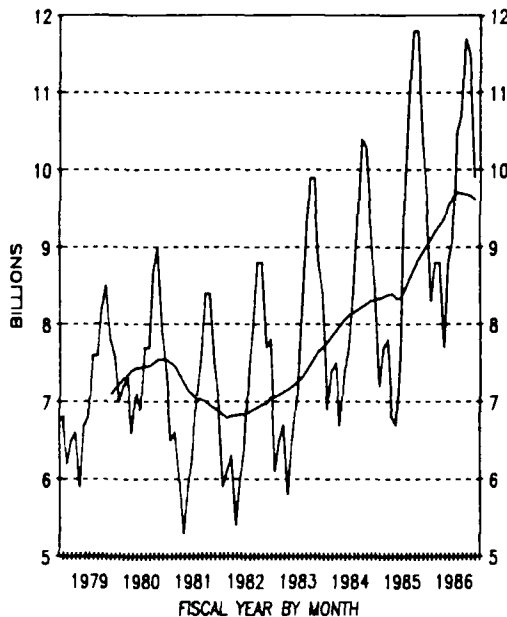
PASSENGER ENPLANEMENTS



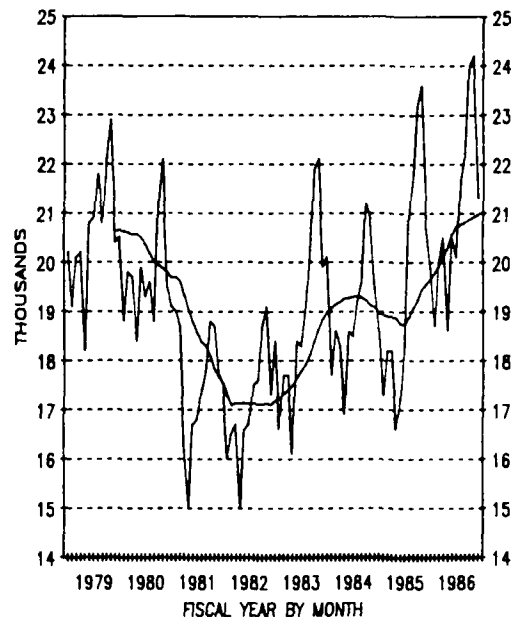
U.S. AIR CARRIER CAPACITY AND TRAFFIC TRENDS

INTERNATIONAL OPERATIONS

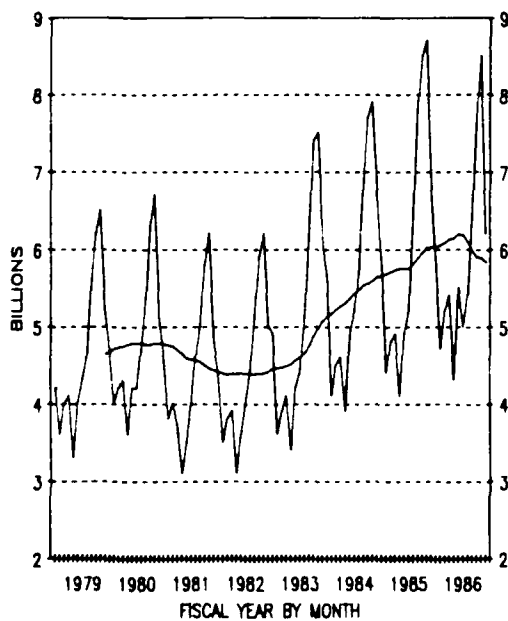
AVAILABLE SEAT MILES



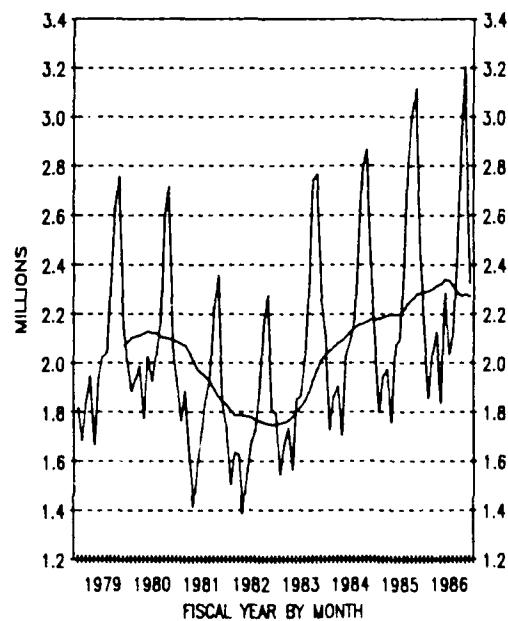
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS

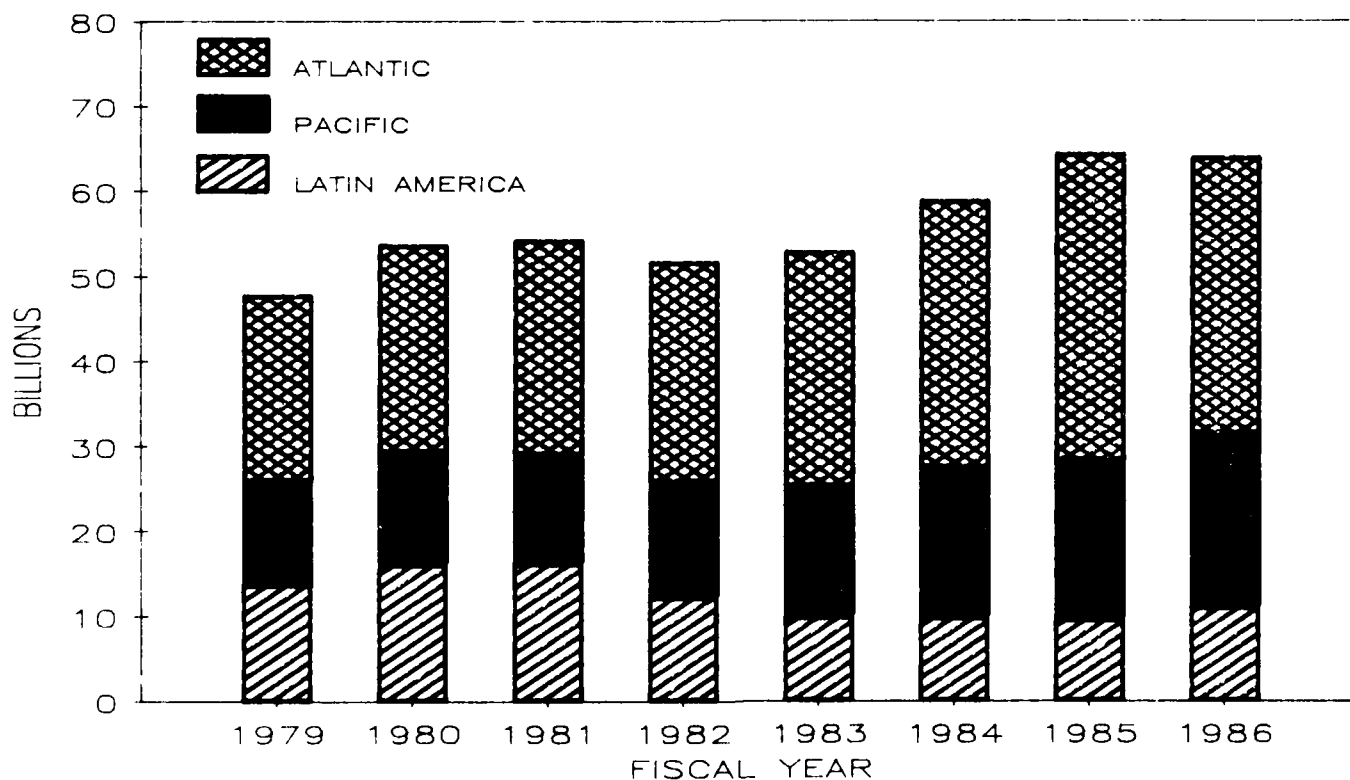


Scheduled International Passenger Traffic and Capacity

International RPM's totaled only 64.1 billion in fiscal 1986, 1.1 percent below 1985 results. This decline in traffic was due not only to a fear of terrorist activities abroad but also to a weakening of the U.S. dollar relative to other world currencies. International passenger enplanements, however, remained at 1985 levels, totaling 24.6 million. Despite declining traffic demand, international ASM's were up 9.8 percent in 1986. As such, international load factors declined 6.6 points to 59.2 percent, the lowest load factor achieved since 1977, the year preceding airline deregulation.

The threat of terrorist activity in Europe and the Middle East was largely responsible for the decline in international traffic, causing a shift in passenger preferences from European destinations to other international or domestic destinations. Overall, passenger traffic (RPM's) on international Atlantic routes declined by 9.8 percent in fiscal 1986. However, most of the decline occurred after March 1986, with RPM's during the last six months of fiscal 1986 declining 20.5 percent below the same 1985 period. Although ASM's on the Atlantic routes were up 7.8 percent in 1986, most of the growth occurred prior to April 1986. During the last 6 months of the year, capacity actually declined by 3.3 percent. The load factor on scheduled service to Atlantic destinations declined to 56.0 percent in 1986, 11.0 points below the load factor achieved in 1985.

U.S. COMMERCIAL AIR CARRIERS
INTERNATIONAL RPM'S BY ENTITY



Traffic to other international destinations, however, benefited from the unstable political situation in Europe and the Middle East. Passenger traffic to Latin American and Pacific destinations increased by 14.7 and 8.7 percent, respectively, in fiscal 1986. Capacity on Latin American and Pacific routes increased by 12.3 and 15.0 percent, respectively, during the same time period. In fiscal 1986, a load factor of 60.2 was achieved on scheduled service to Latin American destinations, 64.4 percent on service to Pacific destinations.

Nonscheduled Traffic and Capacity

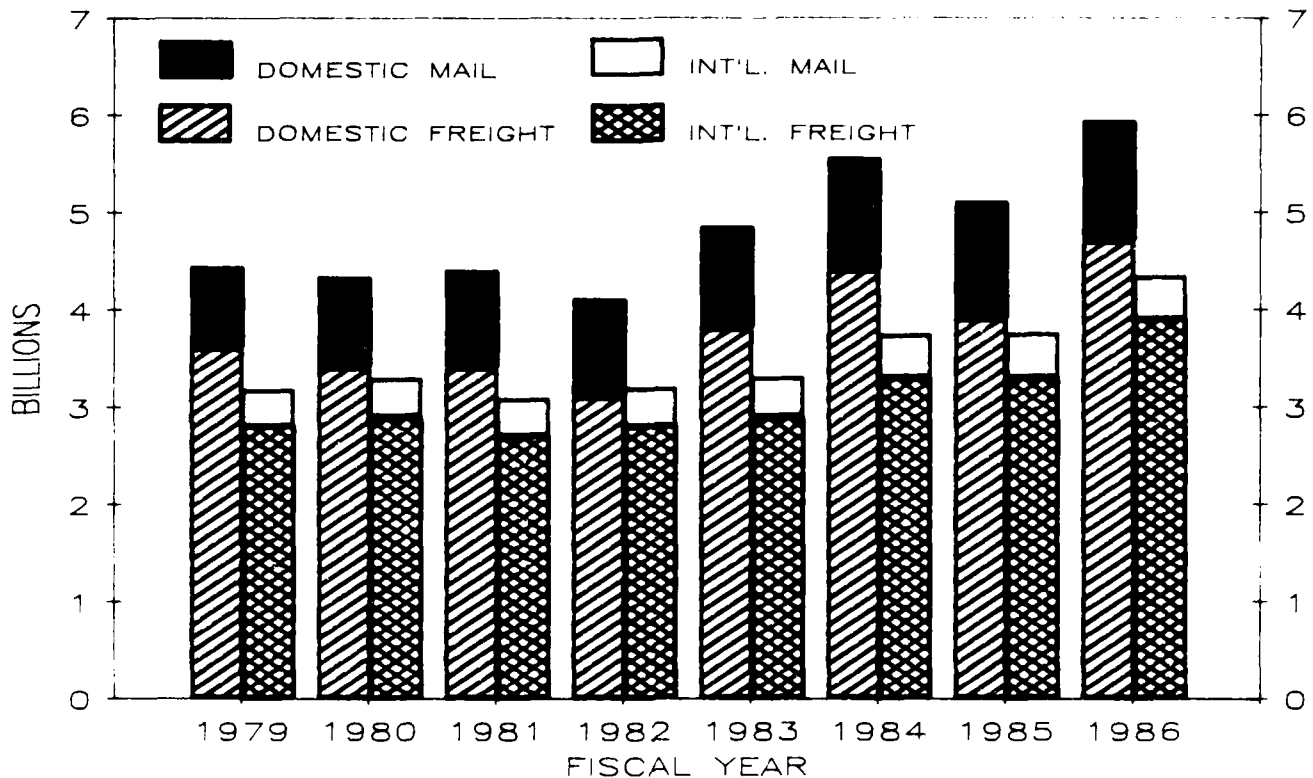
The number of nonscheduled (charter) passengers flying on U.S. commercial air carriers totaled only 7.6 million in fiscal 1986, a decline of 8.2 percent from the same 1985 period. Nonscheduled domestic enplanements declined 8.7 percent to 4.9 million, while nonscheduled international passengers declined 6.9 percent to 2.7 million. Nonscheduled RPM's declined 15.2 percent in fiscal 1986 to 12.7 billion, split about evenly between domestic and international destinations. A load factor of 79.6 percent was achieved on nonscheduled flights, 84.2 percent on international routes, and 75.5 percent on domestic routes.

Air Cargo Traffic

The number of air cargo revenue ton miles (RTM's) flown by U.S. air carriers reporting on RSPA Form 41 totaled 10.3 billion in fiscal 1986, an increase of 15.2 percent over 1985. This included an increase of 18.8 percent in total freight and express RTM's, but only a 1.0 percent increase in mail RTM's. Domestic freight and express RTM's increased by 20.3 percent in 1986, international freight and express RTM's by 17.0 percent. Mail RTM's increased by 2.4 percent in domestic markets, but declined by 2.3 percent in international markets.

A large part of the increase in domestic freight and express RTM's can be explained by the fact that Federal Express, formerly a small package carrier, started reporting to RSPA in January 1986. Without Federal Express, the growth in domestic markets would have totaled only 5.7 percent, 14.8 percent in international markets. However, there are still a large number of small package carriers who do not report cargo traffic to RSPA. For the 12 months ending June 1986, small package carriers (20 carriers, excluding United Parcel Service, but including Federal Express) reported a total of 204 million packages carried, a 14.5 percent increase over the comparable 12-month period ending in June 1985. No data are available on the weight of these shipments.

U.S. COMMERCIAL AIR CARRIERS AIR CARGO REVENUE TON MILES



INDUSTRY EXPANSION, CONSOLIDATION AND CONCENTRATION

Fiscal 1986 will most certainly be remembered as the "Year of Consolidation." During this 12-month period there were 7 mergers among the major U.S. air carriers. The larger air carriers also acquired 10 smaller commuter airlines for use as dedicated "feeders." In addition, 7 scheduled air carriers, 18 including charter carriers and commuters, either filed for bankruptcy, ceased operations, or both. At the end of the fiscal year, there were 46 commercial air carriers engaged in scheduled passenger air service, 16 more than had existed prior to deregulation, but 11 fewer than had been in operation one year earlier. Of this 46 scheduled airlines, only 17 were carriers that had been in existence prior to deregulation.

Industry Expansion

In fiscal 1978, the commercial air carrier industry consisted of 30 airlines which provided scheduled passenger service within the United States. Ten of these carriers also operated scheduled passenger services between the U.S. and international destinations. In 1978, carriers were classified as either trunks, local service, regional, Alaskan, Hawaiian, or other. Eleven trunk carriers accounted for 93.7 percent of total passenger traffic (RPM's) in 1978, 92.2 percent of the domestic traffic and 100 percent of the international traffic. Prior to deregulation, scheduled operations and traffic were fairly well concentrated among what was commonly referred to as the "Big Four" carriers, consisting of American, Eastern, Trans World, and United, which together accounted for 53.1 percent of total passenger traffic in 1978.

Over the following 8-years, approximately 75 additional air carriers were added to the list of commercial air carriers providing scheduled passenger service. These new carriers consisted of former intrastate airlines (i.e., Southwest, Pacific Southwest), former charter airlines (i.e., Capitol, World), former commuters (i.e., Air Wisconsin, Horizon Air), and newly established air carriers (i.e., Midway, New York Air, People Express). However, a large number of these 75 new airlines, for one reason or another, also ceased operations during this period. Nineteen of the former commuter airlines elected to return to commuter airline status and another 25 carriers either filed for Chapter 11 bankruptcy, ceased operations, or both.

On the other hand, a number of these new airlines have, over the years, become quite successful. By fiscal 1986, 10 of these carriers had been classified as Nationals (operating revenues of between \$100,000 and \$1 billion) and together accounted for 9.7 percent of industry traffic. In fact, one carrier's traffic (People Express) ranked it as the ninth largest U.S. air carrier in fiscal 1985.

The entry of these newly established carriers into the previously protected markets had quite an impact on those carriers that had existed prior to deregulation. By the end of fiscal 1980, the 11 trunk carriers (now classified as Majors) had shrunk in number to 10 (Pan American purchased National Airlines) and their share of industry traffic had declined from 93.7 percent to 87.9 percent. By the end of fiscal 1983, the number of former trunks was only nine (Braniff declared Chapter 11 bankruptcy) and their share of industry traffic had declined to 80.1 percent. The "Big Four" did not fare much better during this period. By 1980 their share of industry traffic was only 48.8 percent, down from 53.1 percent just three years before. However, between 1980 and 1983, their share declined only slightly to 47.2 percent as the larger carriers learned to compete more effectively in a deregulated environment.

This erosion of traffic share continued through fiscal 1985, when the former trunks' share of industry traffic stood at 77.0 percent. The "Big Four" carriers' share of industry traffic declined to a low of 45.4 percent in that year. However, this was partially attributable to a strike at United. In fiscal 1986, it soon became evident that the larger carriers were no longer content with maintaining their share of industry traffic. They were now apparently convinced that the most effective way to compete in today's deregulated environment was by size. This set the stage for the "Year of Consolidation."

EXPANSION/CONSOLIDATION OF PREDEREGULATION PASSENGER AIRLINES

<u>CARRIER GROUPING & NAME</u>	<u>DATE & CARRIER INVOLVED IN MERGER/ACQUISITION</u>	<u>DATE CARRIER CEASED OPERATIONS</u>
<u>Trunks</u>		
1. American (AA)	11/86 Announced intent to purchase AirCal	
2. Braniff (BN)		5/82 Chapter 11 Ceased operations 3/84 Resumes Service
3. Continental (CO)	10/82 Acquired by Texas Air Corp. 11/82 Acquires Texas International 4/86 Acquires Rocky Mountain Airways 9/86 Acquires Eastern 9/86 Acquires People Express/Frontier	
4. Delta (DL)	5/86 Acquires Atlantic Southeast 5/86 Acquires ConAir 12/86 Acquires Western	
5. Eastern (EA)	9/86 Acquired by Continental	
6. National (NA)	1/80 Acquired by Pan American	1/80 Ceased operations
7. Northwest (NW)	10/84 Acquires Messaba Airlines 9/86 Acquires Republic	
8. Pan American (PA)	1/80 Acquires National 2/86 Sells Pacific routes to United 4/86 Acquires Ransome Airlines	
9. Trans World (TW)	9/86 Acquires Ozark	
10. United (UA)	2/86 Acquires Pan Am's Pacific routes	
11. Western (WA)	12/86 Acquired by Delta	
<u>Local Service</u>		
12. Allegheny (AL)	10/79 Name changed to USAir 10/85 Acquires Pennsylvania Airlines 4/86 Acquires Suburban Airlines 12/86 Announced intent to purchase Pacific Southwest Airlines	
13. Frontier (FL)	10/85 Acquired by People Express	9/86 Ceased operations
14. Hughes Airwest (RW)	10/80 Acquired by Republic	10/80 Ceased operations
15. North Central (NC)	7/79 Merged with Southern to form Republic	7/79 Ceased operations

EXPANSION/CONSOLIDATION OF PREDEREGULATION PASSENGER AIRLINES (CONTINUED)

<u>CARRIER GROUPING & NAME</u>	<u>DATE & CARRIER INVOLVED IN MERGER/ACQUISITION</u>	<u>DATE CARRIER CEASED OPERATIONS</u>
16. Ozark (OZ)	9/86 Acquired by Trans World	10/86 Ceased operations
17. Piedmont (PI)	10/83 Acquires Henson Airlines 10/85 Acquires Empire Airlines 7/86 Acquires Jetstream Int'l.	
18. Southern (SO)	7/79 Merged with North Central to form Republic	7/79 Ceased operations
19. Texas International (TI)	11/82 Acquired by Continental	11/82 Ceased operations
<u>Regional</u>		
20. Air Midwest (ZV)	6/85 Acquires Scheduled Skyways	1/85 Began operating as Part 135 commuter
21. Air New England (NE)		10/81 Chapter 11 Ceased operations
<u>Alaskan</u>		
22. Alaska (AS)	9/86 Agrees to purchase Jet America 10/86 Acquires Horizon Air	
23. Kodiak (KO)		12/82 Began operating as Part 135 commuter
24. Munz (XY)		8/84 Began operating as Part 135 commuter
25. Reeve (RV)		
26. Wien Air (WC)		11/84 Ceased operations 9/95 Resumed service 10/85 Chapter 11 Ceased operations
<u>Hawaiian</u>		
27. Aloha (AQ)		
28. Hawaiian (HA)		
<u>Other</u>		
29. Aspen (AP)		8/82 Began operating as Part 135 commuter 1/85 Resumed service as Part 21 carrier
30. Wright (FW)		11/82 Began operating as Part 135 commuter

Industry Consolidation

Although fiscal 1986 will be largely remembered for the large number of mergers that occurred during the year, industry consolidation actually started seven years earlier. In July 1979, Southern and North Central Airlines merged to create Republic Airlines. Not content with what was basically still a regional route system, Republic purchased Hughes AirWest in November 1980, and expanded its route system to the West Coast. Thus, the merger of three former local service carriers had formed one Major carrier (operating revenues of over \$1 billion), and the industry consolidation phase had begun.

Pan American merged with National Airlines in 1980, theoretically to obtain a domestic route system. However, the real significance of this merger action was not that Pan American eventually won the rights to takeover National but, rather, that Texas International Airlines lost. With the profits made from the sale of its National Airlines stock, Texas International started New York Air in January 1981. In January 1982, the Texas Air Corporation was set up to operate New York Air. In October 1982, the Texas Air Corporation purchased Continental Airlines and combined it with Texas International. Continental continued to operate as a separate entity, but Texas International went out of existence.

Merger activity remained fairly dormant for the next couple of years, reappearing again in March 1985 when Southwest Airlines purchased Muse Air (later to be renamed TranStar), one of its major competitors in Texas markets. However, merger actions began in earnest again in fiscal 1986. What follows below is a partial listing of the mergers and acquisitions that occurred during a twelve month period beginning in October 1985.

- o October 1985 Piedmont acquires Empire Airlines.

 People Express acquires Frontier Airlines.
- o January 1986 People Express acquires Provincetown-Boston Airways (commuter).

 Northwest proposes to purchase Republic Airlines. Approved August 1986.
- o February 1986 Texas Air agrees to purchase Eastern Airlines. Approved September 1986.

 People Express acquires Britt Airways (commuter).

 Trans World agrees to purchase Ozark Air Lines. Approved September 1986.
- o April 1986 Pan American acquires Ransome Air (commuter).

 Texas Air acquires Rocky Mountain Airways (commuter).

 USAir acquires Suburban Airlines (commuter).

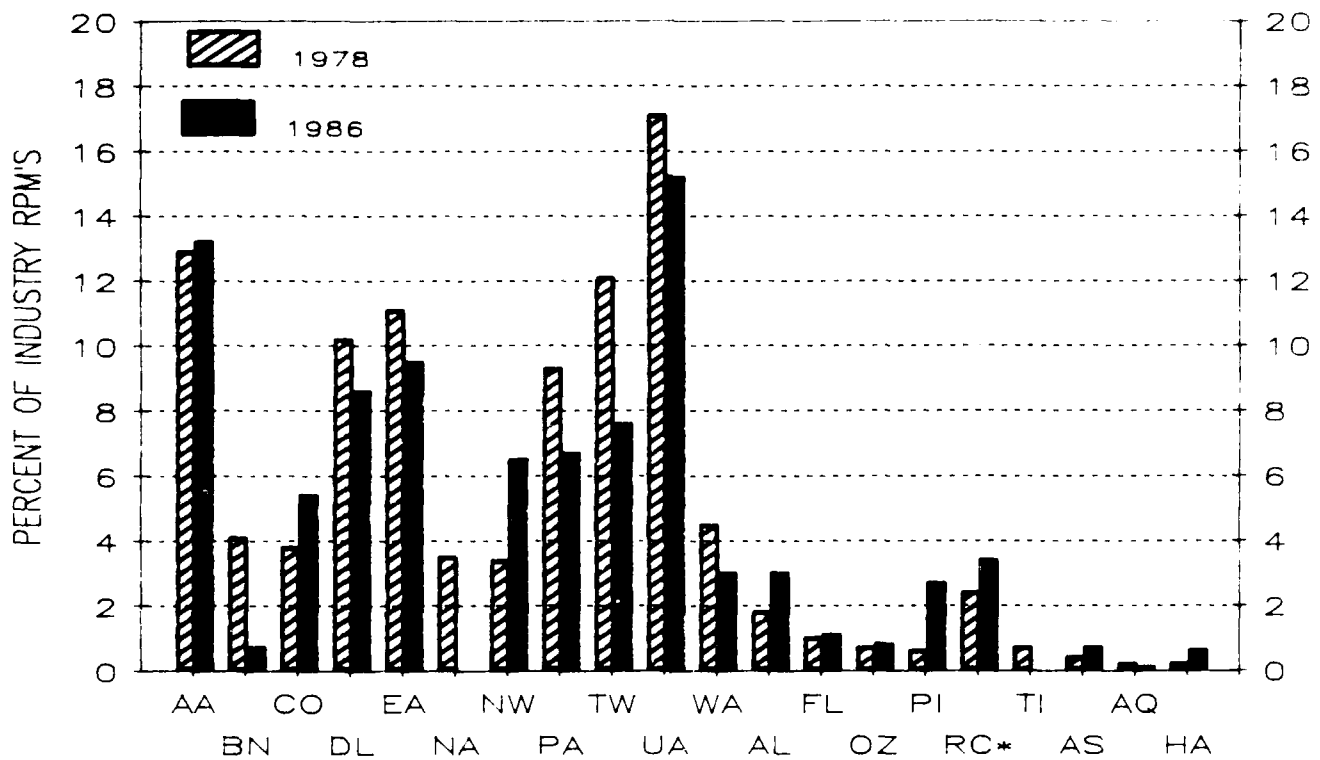
- o May 1986 Delta acquires Atlantic Southeast (commuter).
 Delta acquires Comair (commuter).
- o July 1986 Piedmont acquires Jet Stream International (commuter).
 Presidential Airways acquires Key Airlines (commuter).
- o August 1986 Presidential Airways acquires Colgan Airways (commuter).
- o September 1986 Delta agrees to purchase Western Airlines. Approved
 December 1986.
 Texas Air Corporation agrees to purchase People Express.
 Approved October 1986.
 Alaska Airlines agrees to purchase Jet America.

Merger activity did not, however, cease at the end of fiscal 1986. Nor is there any reason to believe that such activity will not continue for at least the next several years. During the first quarter of fiscal 1987, American Airlines announced its intention to purchase AirCal, and USAir announced its intention to purchase Pacific Southwest Airlines. Alaska Airlines purchased Horizon Air, a commuter airline. In January 1987, Presidential Airways agreed to a 10-year joint marketing agreement with Continental to begin providing scheduled passenger service as "Continental Express." The consolidation that began in 1979 has had a profound impact on the structure of the commercial airline industry, and its impact will be felt for years to come.

Industry Concentration

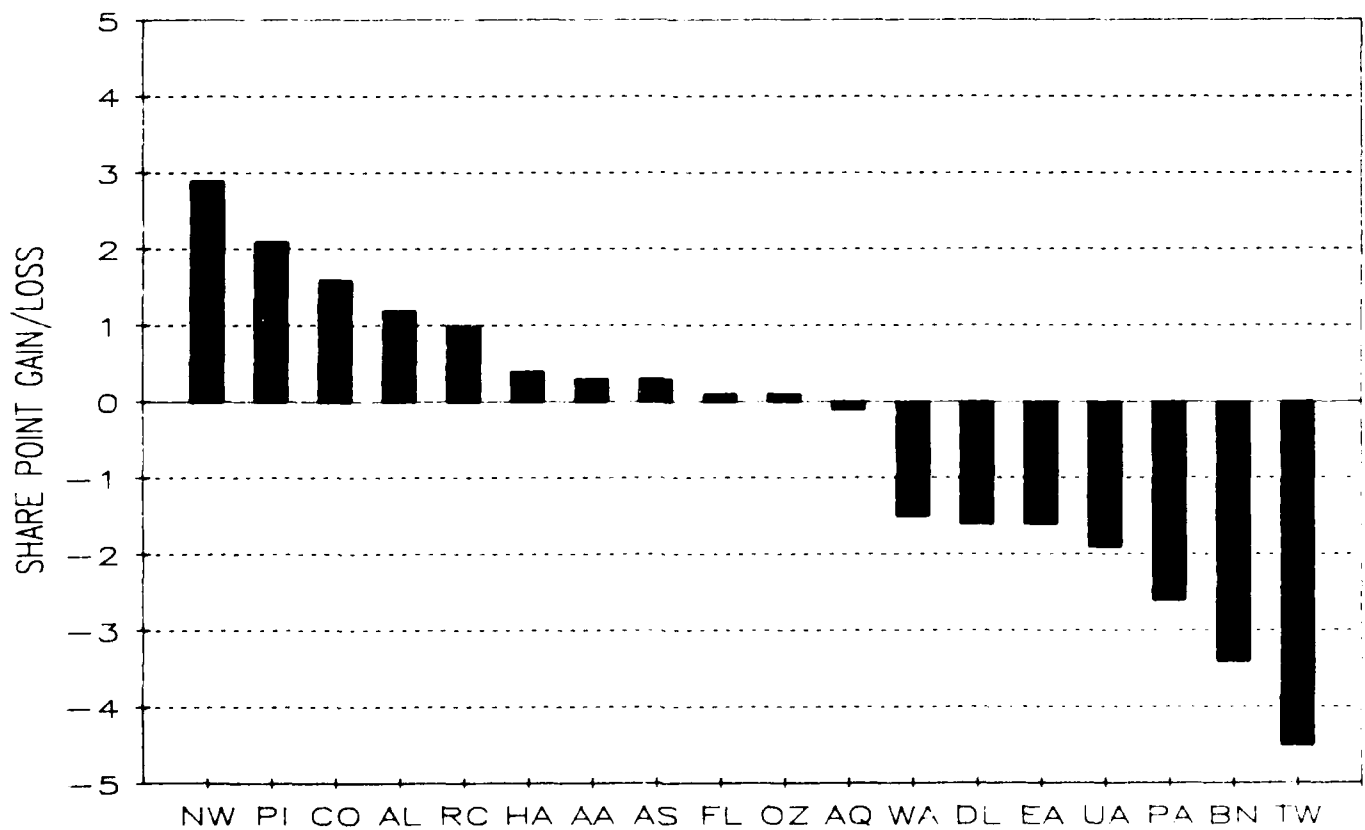
During fiscal 1986, 7 mergers and a buy out of 10 smaller commuter airlines has occurred. These mergers have been approved despite the expressed fear that several of the mergers might limit competition at several large hub airports. This was particularly evident in the Northwest/Republic and the Trans World/Ozark mergers where the merging carriers were the two largest competitors at the Minneapolis/St. Paul, Detroit, and St. Louis airports. What impact these mergers will have on the flight schedules and fares at these three airports is still in question. Additionally, the Continental/Eastern/People Express/Frontier mergers, in effect, have created the U.S.'s largest commercial airline. The direction that Texas Air Corporation takes will go a long way in determining the future structure of the commercial airline industry. Will any of the surviving carriers preserve the discount fare policy advocated by People Express, or will the low-fare airline concept become a relic of the past? Additionally, given the industry's large debt structure, the question should be asked as to what would be the impact of the bankruptcy of one of the "mega-carriers," both on the industry itself and on the traveling public?

SELECTED PREDEREGULATION CARRIERS SHARE OF INDUSTRY TRAFFIC



* 1978 EQUALS COMBINED TRAFFIC OF RW, NC AND SO

CARRIER TRAFFIC SHARE GAIN/LOSS 1978 TO 1986



MAJOR'S 1986 TRAFFIC SHARE PRE- AND POST MERGERS/ACQUISITIONS



* TEXAS AIR CORP. POST MERGER INCLUDES CO, EA, FL, AND PE

Whatever direction the industry takes, one thing is clear. Control of the industry has become more concentrated in the hands of a few large carriers than it was prior to deregulation. In fiscal 1986, the combined results of the "New Big Four," consisting of American, Continental/Eastern/New York Air/People Express, Delta/Western, and United, accounted for 59.8 percent of total industry traffic. This is nearly 6 percentage points higher than the combined results that the original "Big Four" carriers achieved in 1978. Although the ground rules have changed in a deregulated environment, such heavy concentration among a few large carriers has been criticized, by some, as being contrary to the original intent of the Airline Deregulation Act of 1978. The consolidation witnessed over the past year could lead to either a less or a more competitive industry. Hopefully, the commercial aviation industry of the future will be even more vigorous and competitive than the one we are familiar with today.

FORECAST ASSUMPTIONS

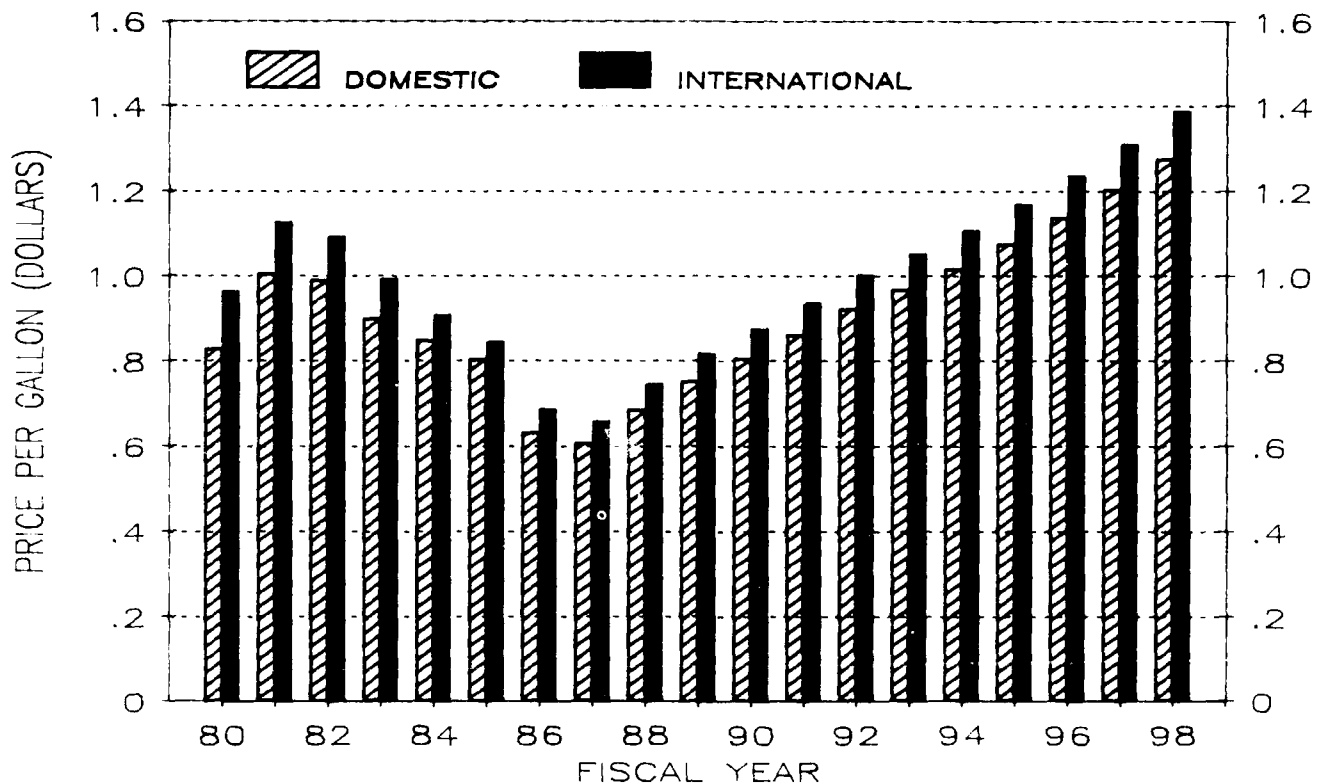
The baseline forecasts of commercial air carrier traffic and activity over the next 12 years anticipate that the industry will continue to be affected by the deregulation process at least into the next decade. While it is impossible to foresee all the changes that will occur in the years ahead, it is highly plausible that the consolidation phase begun in fiscal 1986 will continue over the next several years. It is also highly probable that the number of post deregulation low-cost, low-fare carriers in existence today will continue to decline. It is also possible that we may see the emergence of several new low-cost airlines seeking to establish a market niche for themselves. Whether the resultant route systems and service patterns available to the traveling public will reflect a better balance of service in terms of trip frequencies and fares than would have been the case prior to the industry consolidation of 1986 is open to question. It is believed, however, that the industry will continue to experiment with innovative ways of developing travel markets through the use of discount fares or other travel incentives. In addition, commercial air carriers can also be expected to continue to expand their present hubs and to develop new secondary hubs as well. However, this could lead to capacity problems at many large U.S. air carrier airports, and this, in turn, could significantly constrain the growth of air carrier traffic in the future.

Jet Fuel Prices

Between 1978 and 1981, the price of jet fuel increased by over 153 percent, rising to a peak in May 1981 of \$1.052 in domestic markets and \$1.168 in international markets. Since that time, the trend in jet fuel prices has generally been downward. Between May 1981 and August 1985, the price of domestic jet fuel declined 25.8 percent to \$0.781 per gallon; international prices declined 29.3 percent to \$0.82 per gallon. Between August 1985 and January 1986, the price of jet fuel actually increased, up 4.0 percent domestically to \$0.813 per gallon and up 4.3 percent internationally to \$0.813 per gallon. Over the following 8-months, however, the price of jet fuel dropped sharply, reaching price levels last witnessed in early 1979.

At the end of fiscal 1986, U.S. air carriers were paying an average of \$0.433 per gallon for domestic jet fuel and \$0.494 for international jet fuel. The domestic jet fuel price represented a decline of 46.7 percent from the price paid in January 1986 and a decline of 59.0 percent from the peak price paid in May 1981. The international price represented a decline of 42.5 percent from the January 1986 price and a decline of 57.7 percent from the May 1981 peak price. Declining fuel prices have had a direct impact on air carrier profits. When jet fuel prices reached their peak in third quarter 1981, fuel costs accounted for 31.2 percent of total air carrier operating expenses. In the third quarter of fiscal 1986, fuel costs accounted for only 15.4 percent of total operating costs and were expected to decline even further in the fourth quarter. The decline in fuel costs in fiscal 1986 alone is estimated to have reduced air carrier operating costs by over \$2.2 billion.

U.S. COMMERCIAL AIR CARRIERS JET FUEL PRICES



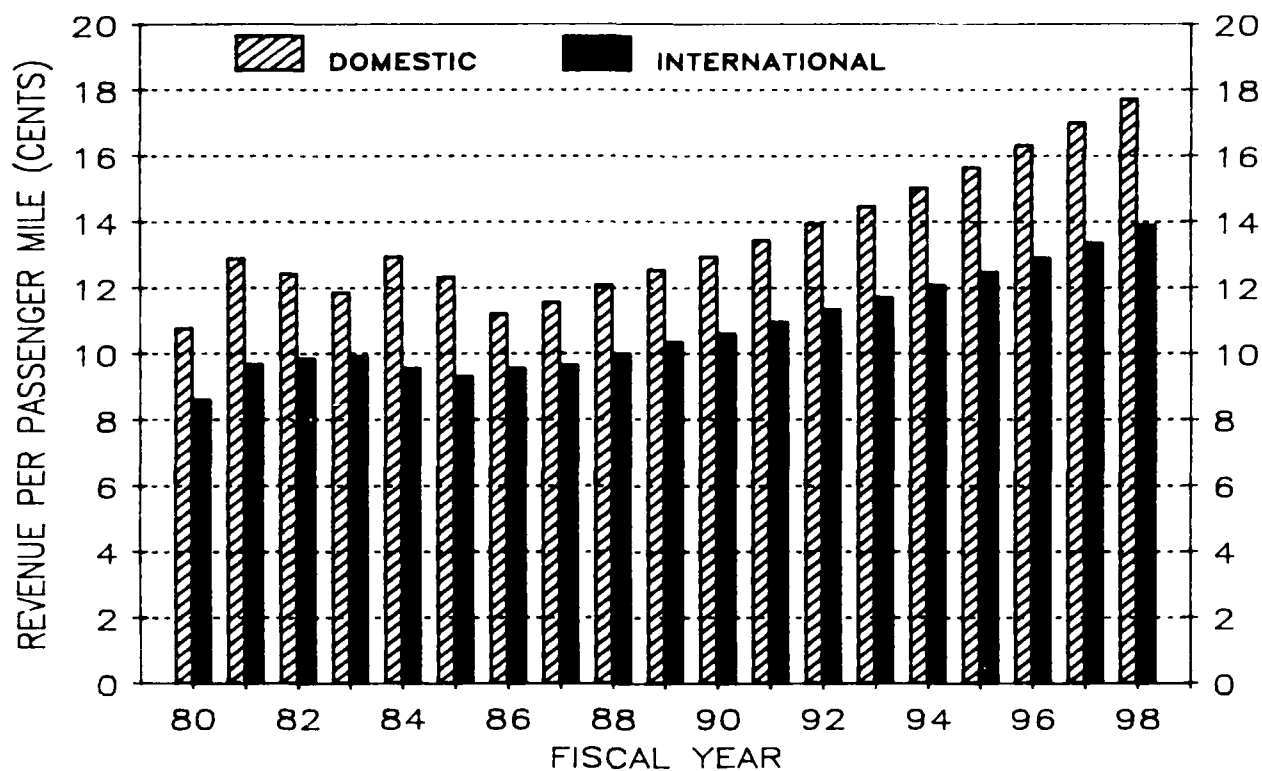
Jet fuel prices are expected to decline by 4.0 percent in 1987 and then to increase by 13.0 percent in 1988 and 9.7 percent in 1989. However, even with such increases, domestic jet fuel prices are not expected to exceed \$1.00 a gallon until 1994, international jet fuel prices not until 1992. Over the entire forecast period, domestic jet fuel prices are forecast to increase at an average annual rate of 6.0 percent, from an average of \$0.635 a gallon in 1986 to \$1.279 a gallon in 1998. International jet fuel prices are forecast to increase from \$0.691 a gallon in 1986 to \$1.392 in 1998.

Passenger Yields

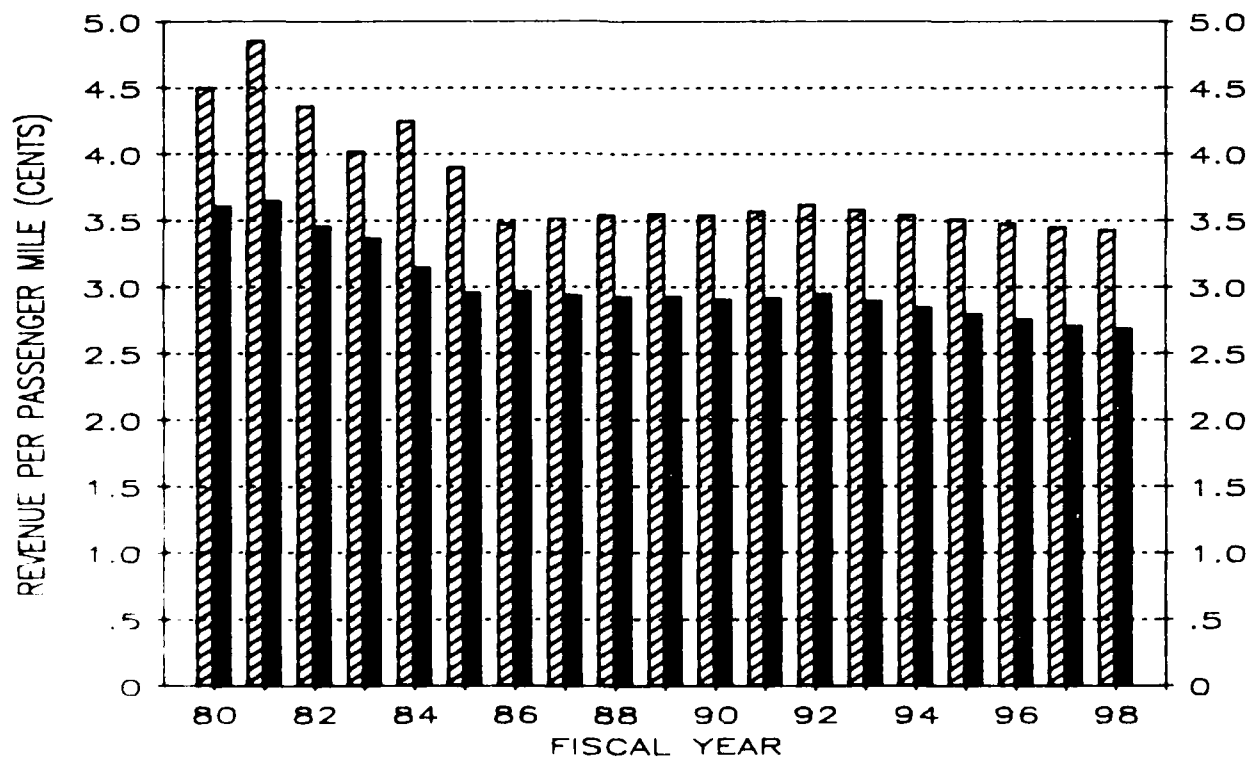
Domestic passenger yields have declined by 13.4 percent over the past two years, 8.9 percent in fiscal 1986. In "real" terms (1967 dollars), yields declined 18.1 percent over the last two years, 10.7 percent in fiscal 1986. Although fare wars were still very much in evidence during the fourth quarter, it is believed that the recent move toward industry consolidation, especially in those markets where direct competition has been reduced or eliminated, will result in an upward movement in the fares offered to the traveling public. This is not to say that discount fares will disappear, because they definitely will not. Competition, or at least the fear of competition, will ensure that discount fares will be available in most, if not all, markets. Moreover, it is also believed that the changes in the fare structure will be of a more subtle nature. There may be fewer seats offered at the lower end of the fare level. Advance purchase requirements for discount fares may be lengthened. Yield management can be expected to play a much larger role in determining the overall fare level over the forecast period.

U.S. COMMERCIAL AIR CARRIERS PASSENGER YIELDS

CURRENT DOLLARS



1967 DOLLARS



This year's forecasts anticipate that domestic yields will increase by 3.0 percent in 1987 and 4.6 percent in 1988, and will average 3.9 percent annually over the 12-year forecast period, increasing from 11.26 cents in fiscal 1986 to 17.77 cents in fiscal 1998. In "real" dollars, domestic passenger yields are forecast to decline by only 1.4 percent over the forecast period, from 3.49 cents to 3.44 cents.

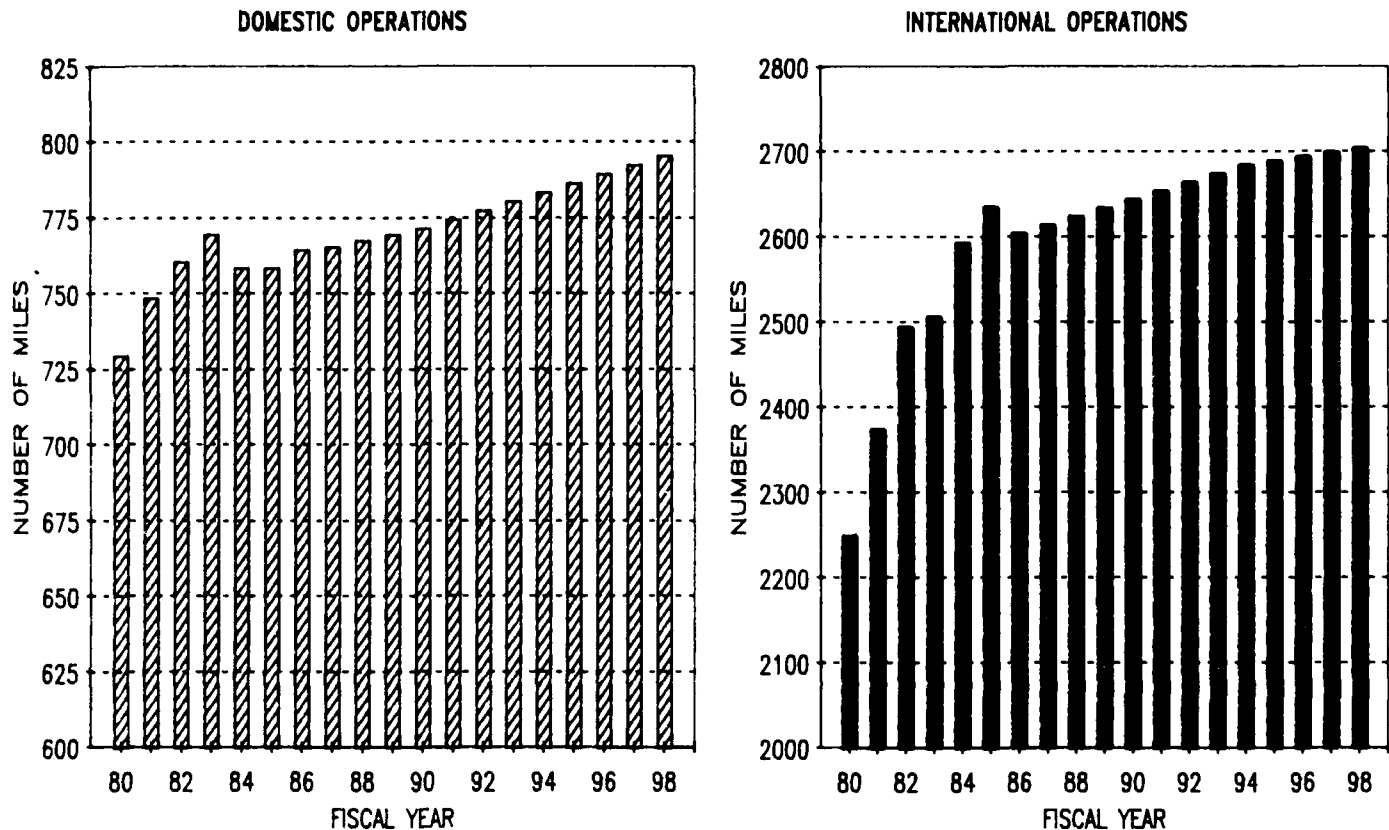
International passenger yields averaged 9.63 cents in fiscal 1986, an increase of 2.7 percent over 1985. In "real" dollars, international yields increased only slightly in 1986. International passenger yields are expected to increase to 13.95 cents in 1998, an average annual increase of 3.1 percent. In "real" terms, the international yield is forecast to decline by 9.4 percent over the forecast period, from 2.98 cents in 1986 to 2.70 cents in 1998.

Passenger Trip Length

The average domestic passenger trip length, responding to industry fare wars, increased by 5 miles in fiscal 1986. This is the first recorded increase since 1983, a period during which the average trip length declined from 770 miles in 1983 to 759 miles in both 1984 and 1985. This year's forecast assumes that the domestic passenger trip length will continue its upward trend throughout the entire forecast period, albeit at a pace somewhat less than the historical long-term average established during the 1970's and early 1980's. However, it should be kept in mind that there are likely to be large swings around the trend line. The movement in any one year will be somewhat dependent upon the discount fare policies adopted by the air carriers and the mix of business/vacation travelers in that particular year. It is expected the average domestic passenger trip length will increase by approximately 2 miles a year through 1990 and by 3 miles a year thereafter. In 1998, the domestic passenger trip length is expected to average 795 miles, up from 764 miles in 1986.

The international passenger trip length declined by 31 miles in fiscal 1986, most of the decline occurring after April 1986 when terrorist activities resulted in a down turn in passenger demand and resulted in U.S. international carriers shifting capacity from European routes to domestic or other international markets. However, the international trip length is expected to increase at more than triple the pace forecast for the domestic trip length. This is due, in part, to the expected increase in service on the recently authorized Pacific routes. Over the 12-year forecast period, the international passenger trip length is expected to increase from 2,605 miles in 1986 to 2,705 miles in 1998.

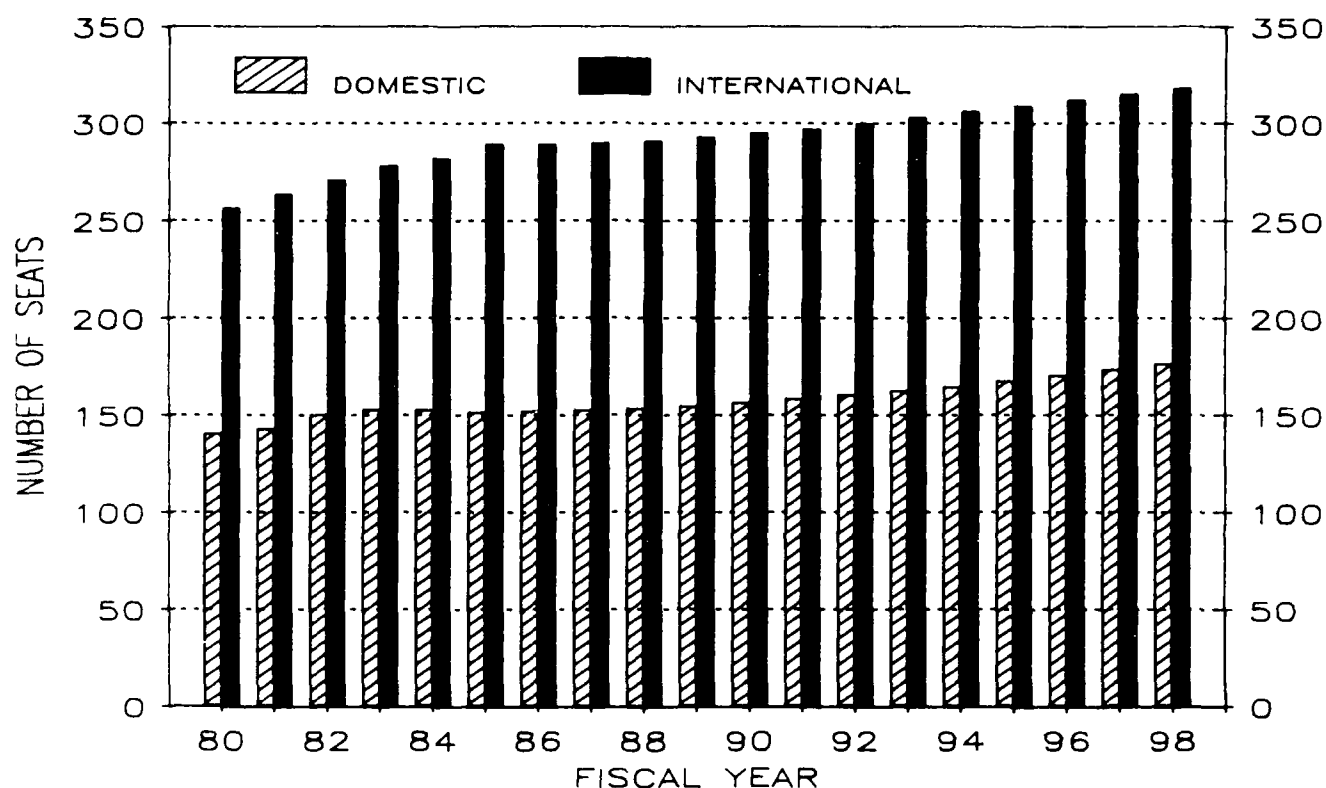
U.S. COMMERCIAL AIR CARRIERS AVERAGE PASSENGER TRIP LENGTH



Average Aircraft Size

Deregulation, declining fuel prices, and the trend toward hub-and-spoke type route systems are, to some extent, responsible for the large increase in the number of small narrowbody aircraft in the U.S. air carrier fleet and the almost nonexistent domestic market for widebody aircraft. The continued expansion of existent hubs and the rapid development of new hubs have also increased the importance of higher frequencies and the demand for more efficient aircraft with smaller seating capacities. As a result, the average seating capacity of an aircraft utilized in domestic service has actually declined by half a seat since 1983. However, it is expected that the average aircraft size will grow throughout the forecast period, although at a rate somewhat less than the average long-term historical trend of three to four seats per year. The forecast assumes that the average seating capacity of aircraft utilized in domestic service will grow by only 1 seat a year through 1989 and will increase by 2 to 3 seats a year thereafter. In 1998, the average seating capacity of an aircraft in domestic service is expected to be 177 seats, up from 153 seats in fiscal 1986.

U.S. COMMERCIAL AIR CARRIERS AVERAGE SEATS PER AIRCRAFT

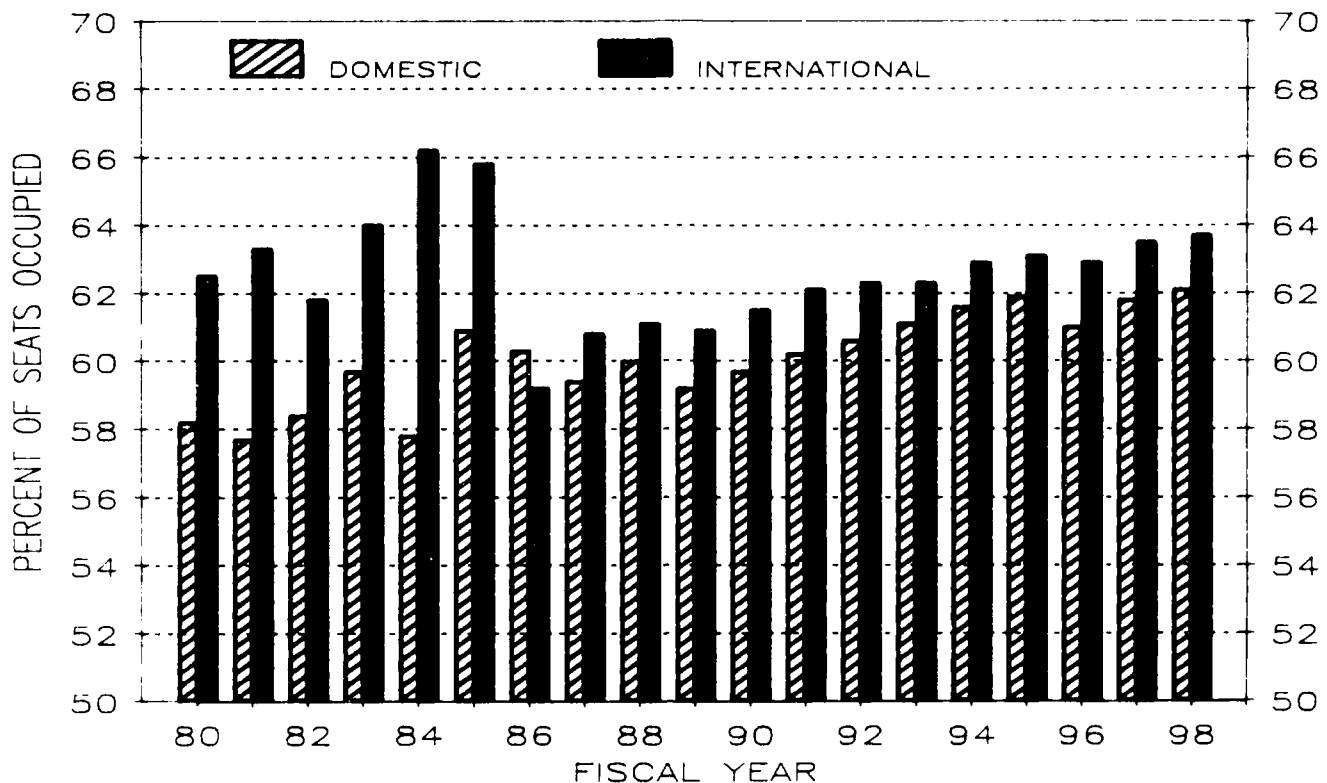


The average seating capacity of aircraft utilized in international service was 290 seats in fiscal 1986, slightly smaller than the average aircraft seating capacity in 1985. It is expected that the average aircraft size of the international fleet will increase at a somewhat faster rate than the domestic fleet, averaging 319 seats in 1998. Slower growth is also expected during the early years of the forecast period due to the increased number of orders for the extended range B-767 aircraft which has been utilized successfully for the last two years across the Atlantic.

Load Factor

In fiscal 1986, the domestic load factor declined 0.6 points to 60.3 percent, while the international load factor declined 6.6 points to 59.2 percent. Based upon projected levels of capacity and traffic, the domestic load factor is expected to decline to 59.4 percent in 1987, to increase to 60.0 percent in 1987, and then to decline to 59.2 percent in 1989. Thereafter, the load factor is forecast to increase gradually, reaching a high of 63.1 percent in fiscal 1998. International load factors are forecast to increase to 60.8 percent in 1987 and then to increase gradually throughout the forecast period, reaching a high of 63.7 percent in 1998.

U.S. COMMERCIAL AIR CARRIERS PASSENGER LOAD FACTOR



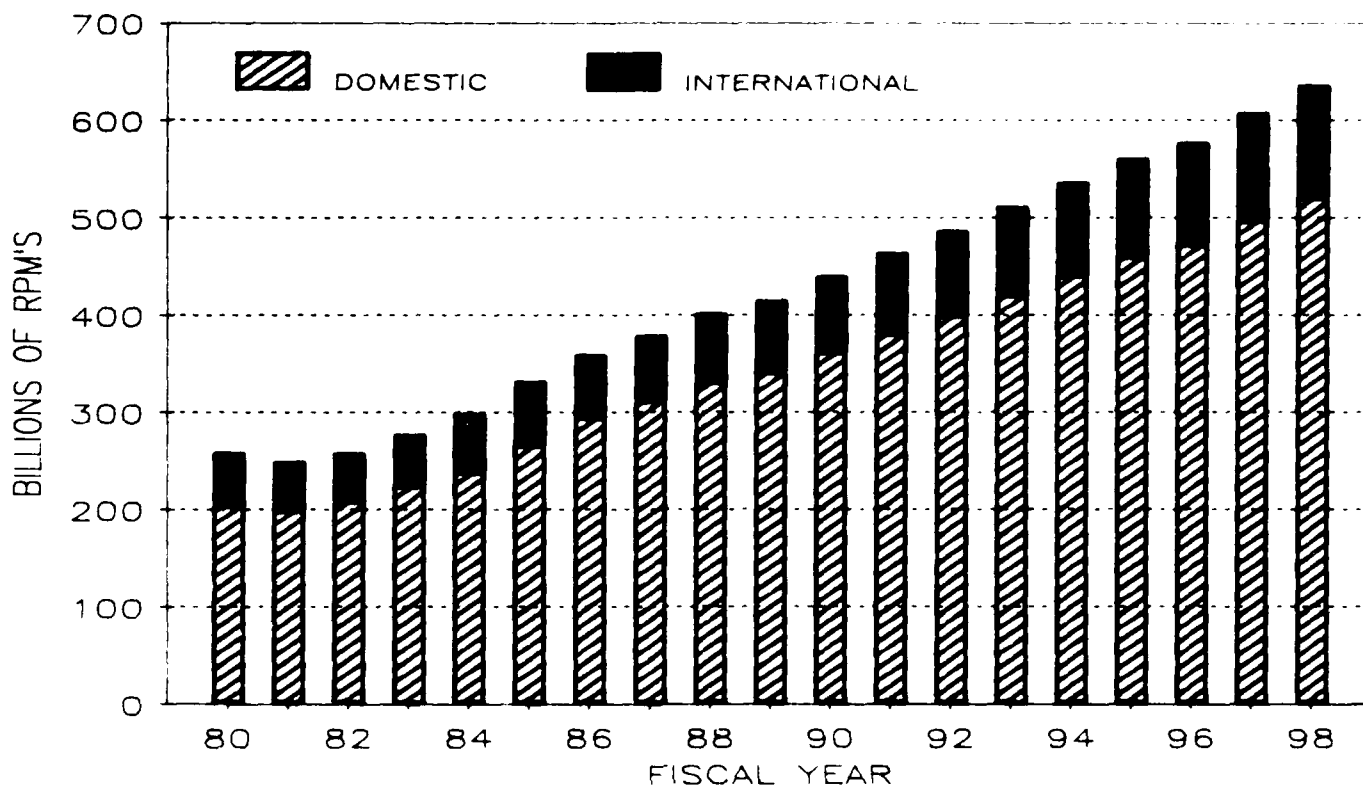
AIR CARRIER FORECASTS

Revenue Passenger Miles

U.S. commercial air carrier revenue passenger miles reached a total of 358.4 billion in fiscal 1986, 294.3 billion in domestic markets and 64.1 billion in international markets. Domestic RPM's are forecast to increase by 5.8 percent in 1987 and 6.1 percent in 1988. Over the next twelve years, domestic RPM's are expected to increase at an average annual rate of 4.9 percent, reaching a total of 520.1 billion in fiscal 1998.

The demand for international travel is expected to remain weak for at least another year, due in part to unstable situations abroad and, in part, to a continued weakening of the U.S. dollar relative to other foreign currencies. However, the weak demand for European travel is offset somewhat by the expected increase in travel to Pacific destinations. As such, international RPM's are forecast to increase at an average annual rate of 5.0 percent over the forecast period, to 115.2 billion in 1998.

U.S. COMMERCIAL AIR CARRIERS SCHEDULED REVENUE PASSENGER MILES

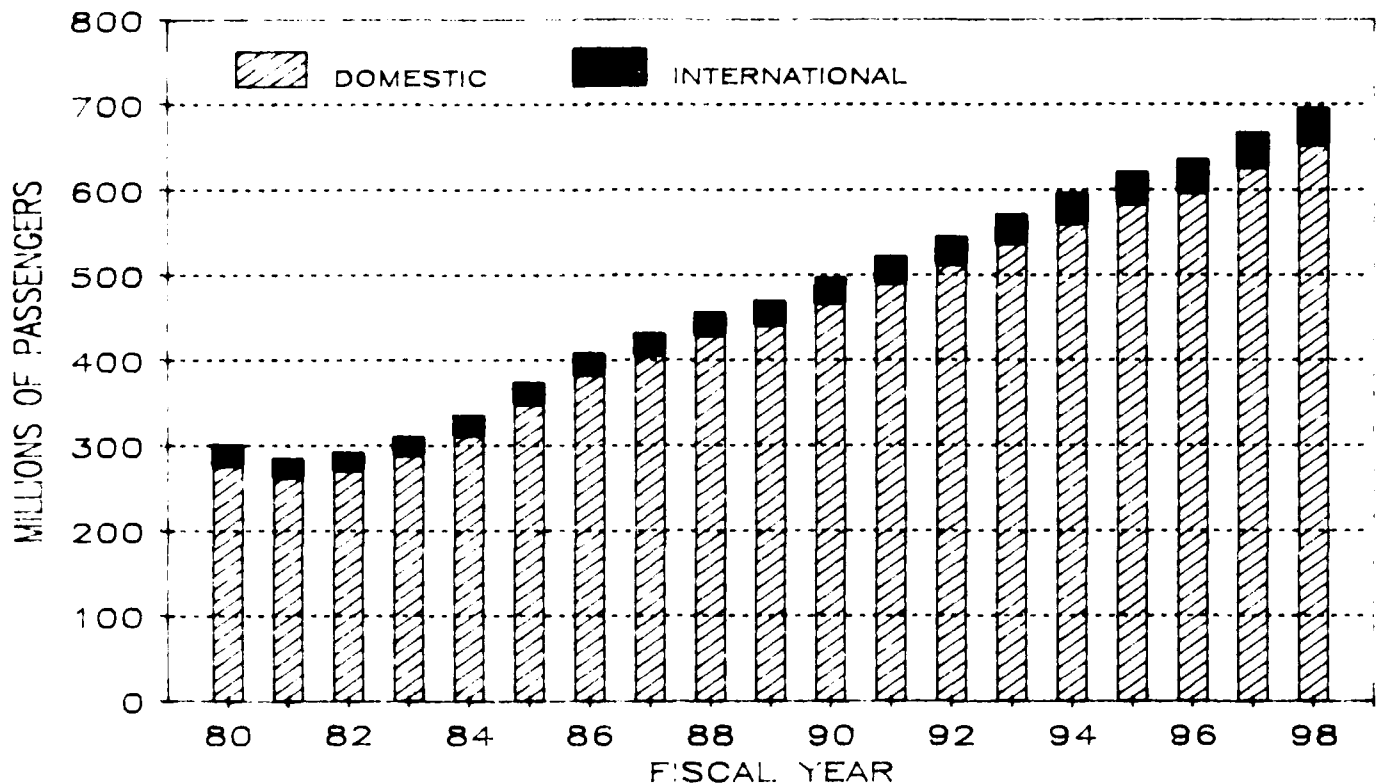


Passenger Enplanements

In fiscal 1986, U.S. commercial air carriers enplaned 409.6 million passengers. Of this total, 385.0 million were counted as domestic enplanements and 24.6 million as international enplanements. Domestic enplanements are expected to increase by 5.7 percent in 1987 and 5.9 percent in 1988, and to average 4.5 percent annually throughout the forecast period. Domestic enplanements are forecast to total 654.2 million in 1998.

International enplanements are forecast to increase by only 4.1 percent in 1987, due, in part, to the expected weak demand for European destinations. However, demand is projected to pick up somewhat in 1988 and to average 4.7 percent annual growth over the entire forecast period. International enplanements are expected to total 42.6 million by the year 1998.

U.S. COMMERCIAL AIR CARRIERS SCHEDULED PASSENGER ENPLANEMENTS

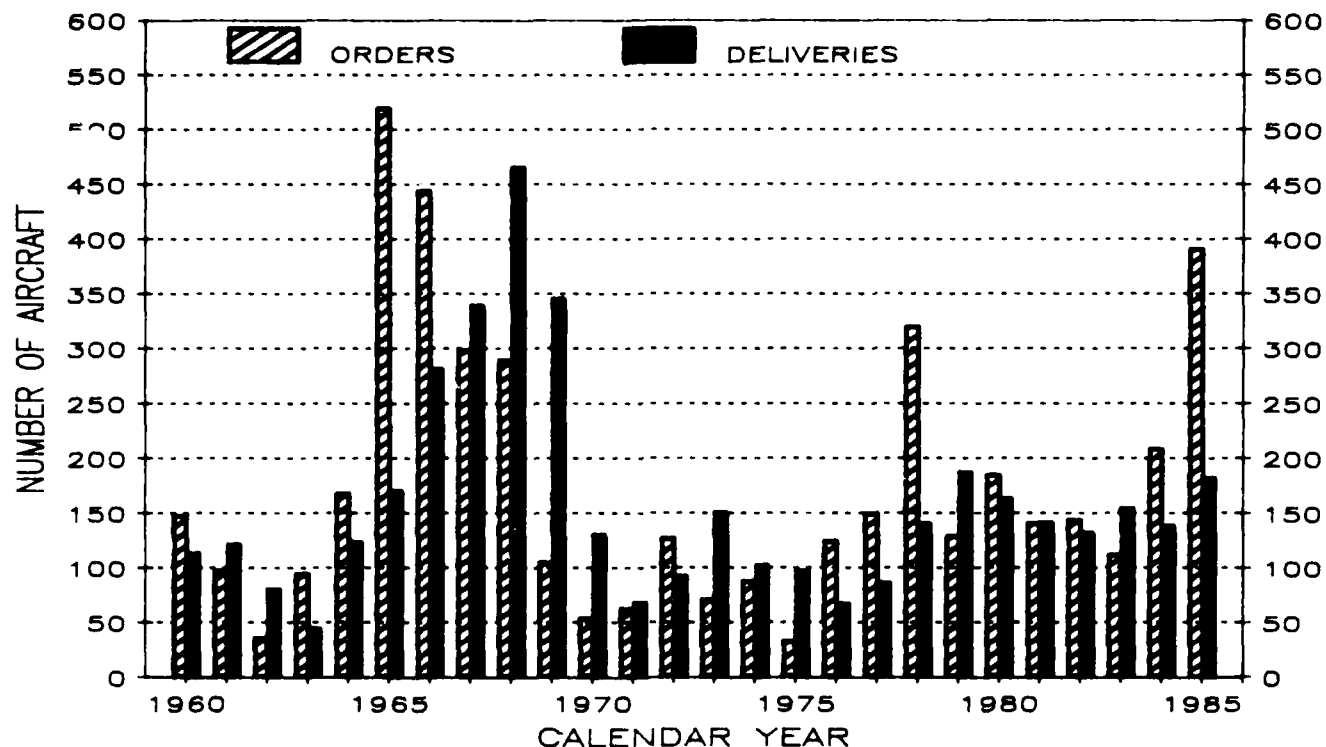


Air Carrier Fleet

Aircraft manufacturers delivered a total of 338 large jet aircraft in fiscal 1986. Of this total, 247 or 73.1 percent were two-engine narrowbody aircraft. Also during this same time period, a total of 676 orders were placed with aircraft manufacturers for large jet aircraft (larger than 60 seats). Of this total, 519 or 76.8 percent were for two-engine narrowbody aircraft. As of September 30, 1986, aircraft manufacturers had a total backlog of 1,151 aircraft on order. A total of 913 or 79.3 percent of the backlog was for two-engine narrowbody aircraft.

Based upon the backlog of aircraft orders and the projections of air carrier traffic, seat capacity, and load factor, the U.S. commercial air carrier fleet is projected to increase from a total of 3,168 large jet aircraft in 1986 to a total of 4,159 aircraft in 1998, an average annual increase of 2.3 percent. This amounts to the delivery of almost 200 aircraft annually and results in the net addition of approximately 73 aircraft to the U.S. fleet each year. By far the fastest growth occurs in two-engine narrowbody aircraft category (B-737, B-757, MD-80, and F-28), which is expected to grow by an average of 107 aircraft annually. In 1998, two-engine narrowbody aircraft are expected to total 2,517 units and to account for 60.5 percent of the total fleet, up from 39.1 percent in 1986. This trend reflects the fact that the prospect for continued expansion and development of hub airports increases the importance of higher frequencies and the demand for aircraft with smaller capacities.

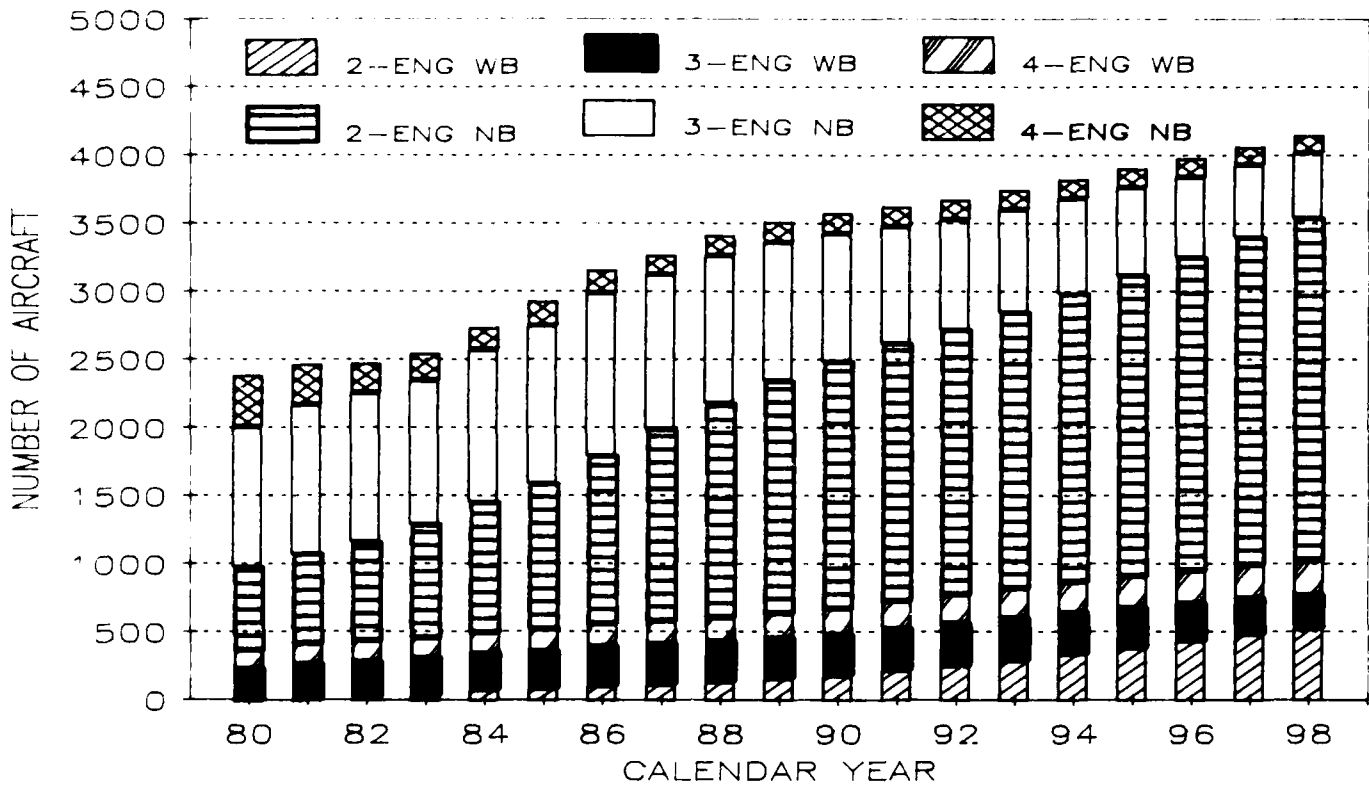
JET AIRCRAFT ORDERS AND DELIVERIES U.S. CUSTOMERS



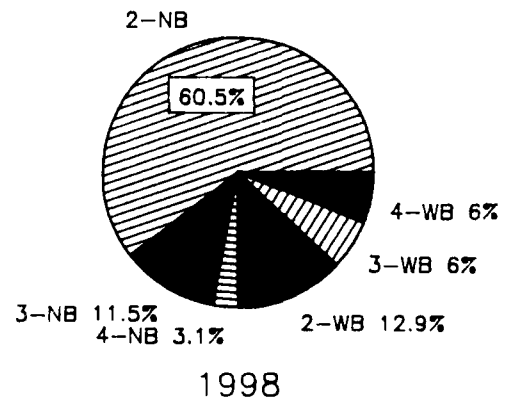
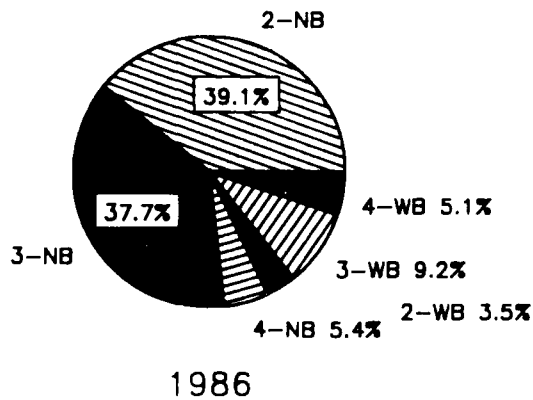
The number of three-engine narrowbody aircraft (B-727), the mainstay of the air carrier jet fleet during the 1970's and early 1980's, is expected to decline from 1,195 aircraft in 1986 to only 480 aircraft in 1998. The number of four-engine narrowbody aircraft (DC-8 and BA-146), and three-engine widebody aircraft (DC-10 and L-1011) is also expected to decline in absolute figures over the forecast period.

Widebody aircraft, which accounted for only 17.8 percent of the fleet in 1986, are expected to account for 24.9 percent of the U.S. air carrier large jet fleet in 1998. Two-engine widebody aircraft (A-300, A-310, and B-767), the fastest growing of the widebody groupings, are expected to increase by an average of almost 36 aircraft annually.

U.S. COMMERCIAL AIR CARRIERS LARGE JET AIRCRAFT



PERCENT BY AIRCRAFT TYPE

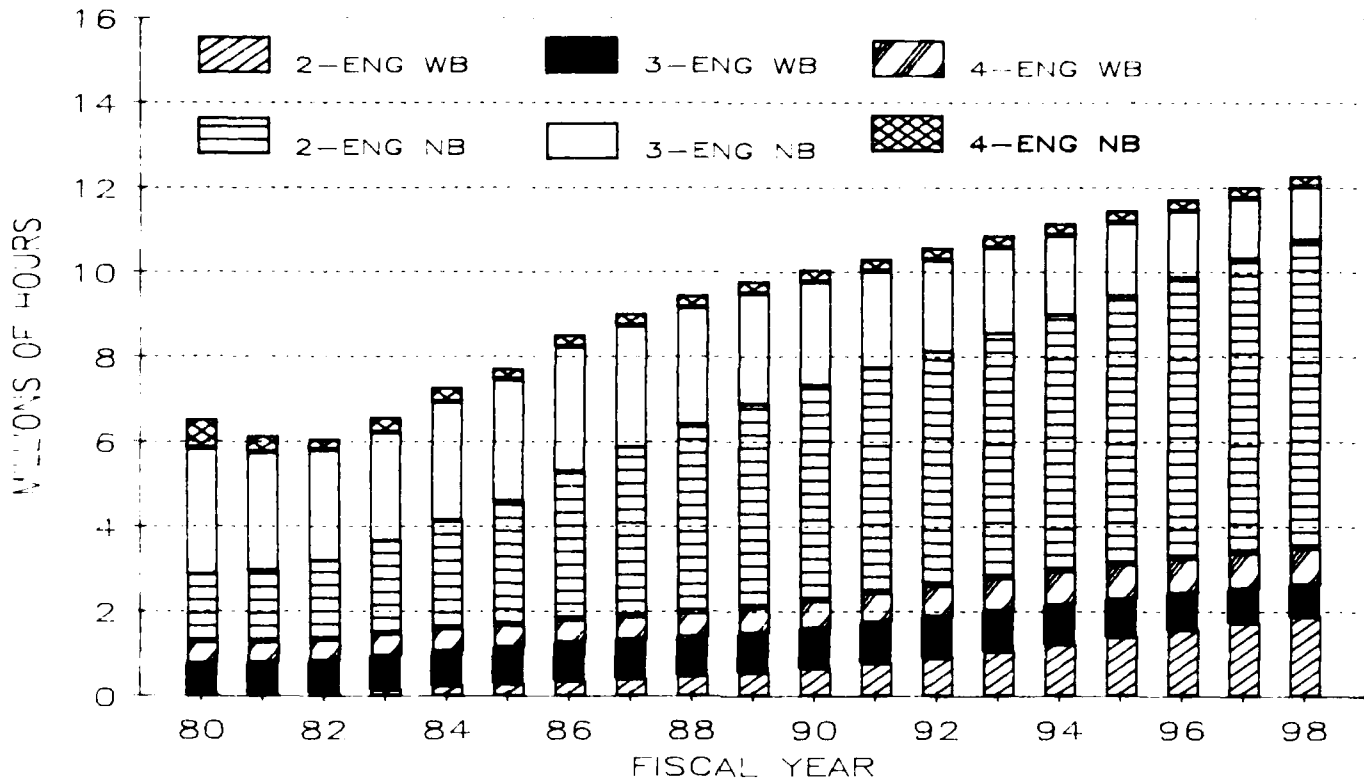


Airborne Hours

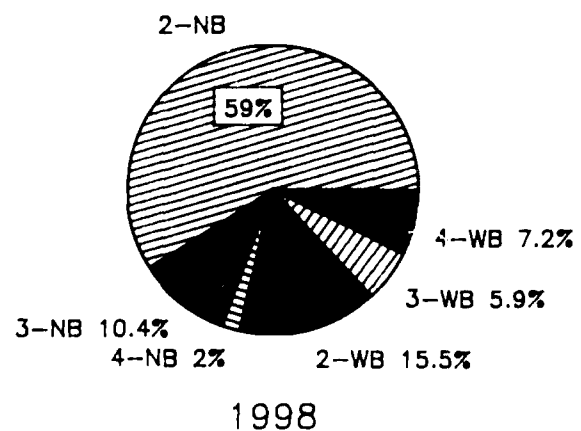
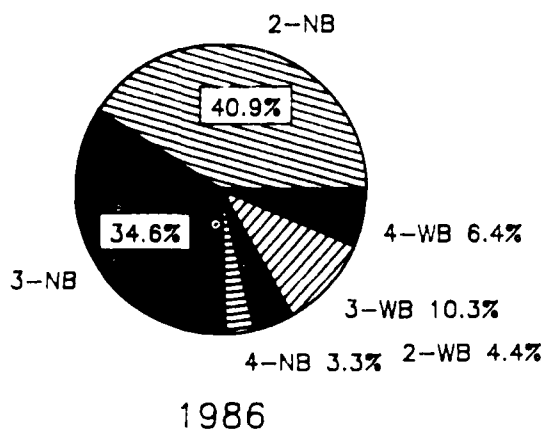
U.S. commercial air carriers flew over 8.5 million hours in fiscal 1986, an increase of 10.3 percent over 1985. Two aircraft categories accounted for the majority of these airborne hours; two-engine narrowbody aircraft for 40.9 percent and three-engine narrowbody aircraft for 34.6 percent. In 1998, the number of airborne hours is forecast to increase to 12.3 million, an average annual increase of 3.1 percent. Much of this growth is expected to occur prior to 1990, reflecting increased hubbing activity at large and medium hub airports. The number of air carrier airborne hours is forecast to increase by 5.9 percent in 1987, 4.8 percent in 1988, and 3.6 percent in 1989.

Two-engine narrowbody aircraft are expected to account for 59.0 percent of total airborne hours in 1998, increasing at an annual rate of 6.3 percent over the 12-year forecast period. Airborne hours by two-engine widebody aircraft are expected to grow at an annual rate of 14.4 percent over the same time period. The two-engine widebody aircraft are expected to account for 15.5 percent of total airborne hours in 1998, up from only 4.4 percent in 1986. The number of airborne hours flown by three-engine narrowbody aircraft is expected to decline by 56.9 percent between 1986 and 1998.

U.S. COMMERCIAL AIR CARRIERS AIRBORNE HOURS



PERCENT BY AIRCRAFT TYPE



Chapter IV

Regionals/Commuters

The regional/commuter airline industry, for the purpose of this forecast, is defined to be those air carriers which provide regularly scheduled passenger service and whose fleets are composed predominantly of aircraft having 60 seats or less. In September 1986, there were approximately 150 regional/commuter airlines reporting traffic data to RSPA. The FAA historical data base includes activity for all regionals/commuters operating in the 48 contiguous states, Hawaii, Puerto Rico, and the U.S. Virgin Islands. Excluded from the data base is activity in Alaska, other U.S. territories, and foreign territories. Additionally, the regional/commuter traffic statistics include duplicated data for selected operators included in the air carrier traffic statistics. The duplication is for those air carriers operating both large jets and commuter type aircraft (see technical notes on page 123 for Table 6 and Table 12).

REVIEW OF 1986

Two years ago, fiscal 1985, the regional/commuter airline industry was in a period of transition, giving rise to the emergence of a number of new factors which would determine the industry composition over the current forecast horizon. These factors included a stabilization in the number of markets served by the large jet operators, a continued decline in the number of regional/commuter operators, and a proliferation of code-sharing agreements with large commercial air carriers.

The effects of the continued growth in code-sharing agreements that occurred during 1986 remain to be seen, and a new, more significant factor has emerged to capture the attention of industry analysts. This new factor is equity interest in or outright ownership of regional airlines by the large major airlines--the next step beyond code-sharing agreements. As the period of transition continues, equity interest in regional/commuter airlines underscores the importance of a good feeder system for a major air carrier operator. While code-sharing agreements represent tacit recognition of the industry as an essential component of the total commercial air transportation network/system, the emergence of equity interest in, or ownership of, a regional by a major formalizes this recognition.

Whatever result the current industry trends may yield, the carriers that survive are likely to be the larger and more stable airlines, closely integrated with major partners.

In fiscal 1986, the regionals/commuters traffic grew at a pace only slightly less than the larger commercial air carriers. Total revenue passenger enplanements increased by 7.0 percent to 26.1 million, while revenue passenger miles (RPM's) increased by 9.4 percent to just under 4.2 billion. For the 48 states, enplanements increased by 6.4 percent, and RPM's increased by 9.4 percent. Traffic in Hawaii, Puerto Rico, and the U.S. Virgin Islands markets also registered significant gains in 1986. Passenger enplanements increased by 12.0 percent and RPM's increased by 8.7 percent. This relatively high rate of growth reflects a recovery from the decline in traffic in 1985 resulting from the cessation of operations by Prinair in June 1985.

Although not included in the historical data base, traffic in Alaska and foreign territories accounted for approximately 3.4 percent of total regional/commuter activity in fiscal 1986. Passenger enplanements in Alaska and foreign territories totaled just under 920,000 in 1986, down 1.4 percent from 1985. The decline is attributable to a 4.4 percent drop in traffic in Alaska, while other U.S. territories and foreign territory traffic increased by 4.8 percent.

INDUSTRY COMPOSITION

The regional/commuter airline industry developed and grew in an unregulated environment. Given the freedom of entry and exit from the marketplace, there were at one time or another, almost 600 different carriers which reported commuter passenger traffic to Civil Aeronautics Board and RSPA between 1970 and 1986. The growth of the industry can be attributed in large part to the role it plays as a feeder of traffic to the larger commercial airlines. The significance of this role is reflected in the growing number of markets served by commuters and in the increasing size and sophistication of aircraft operated by these airlines.

Although a large number of small carriers has operated as commuters and the most that ever operated during a single year was about 250, there is a much greater degree of industry stability than is readily apparent. Historically, the industry has always been dominated by a relatively small number of carriers, most of which have been in operation for many years.

As of September 1986, approximately 150 regional/commuter airlines were reporting to RSPA, compared with the high of about 250 in 1981. While the number of carriers has declined, the average size of today's regional/commuter has grown considerably since deregulation. The growth in size is evidenced by the fact that the average number of passenger enplanements per carrier grew from just over 30,000 in 1970, to over 48,000 in 1978 (6 percent average annual growth), but leaped dramatically to 180,000 by 1986 - an average annual growth of 18.0 percent. This trend toward industry concentration and increased size is expected to continue through the forecast period.

Prior to deregulation, the most significant factor underlying the growth of the commuter industry was the conversion to large turbojet aircraft by the large commercial carriers. The cost of operating large turbojet aircraft was such that traffic at smaller communities proved insufficient to justify continued regular scheduled service. Airline deregulation accelerated this process as the larger certificated air carriers abandoned many of these smaller markets to concentrate on higher density and long-haul markets - markets to which the large jet aircraft were best suited.

While replacement service may continue to offer some residual growth potential, it probably peaked in 1981 with future growth expected to come from the development of existing markets. This is evidenced by the fact that the number of operators has declined continuously since 1981 due to mergers, acquisitions, and bankruptcies.

IMPLICATIONS FOR THE FUTURE

Replacement service has probably ceased to be a significant driving growth factor, although not necessarily eliminating the development of new city-pair combinations. Thus, the previously sustained double digit growth rates will be the exception rather than the rule for the regional/commuter industry. Individual carriers or groups of carriers may continue to grow rapidly, but the industry growth rate will moderate--though remaining significantly above that of the large jet operators. This implies increased internal industry competition spurred by, and/or augmented by, the development of new hubs - with regional feeds, through code-sharing agreements, to help assure their success.

The result of increased competition will be the continuation of the industry consolidation process which began in 1982. With increased consolidation will come increased size of the industry's already dominant carriers. As the consolidation process runs its course, we will continue to see the smaller, weaker commuters either cease operating or be acquired by their dominant regional competitors. Increased size and mutually beneficial partnerships, through code-sharing and/or equity ownership with major operators should enhance the competitive positions of the successful regional operators, and provide greater access to the large financial markets necessary for equipment acquisitions needed to meet the needs of the markets they serve.

AIR CARRIER/COMMUTER AIRLINES

CODE-SHARING AGREEMENTS

<u>AIR CARRIER PROGRAM NAME</u>	<u>DESIGNATED COMMUTER CARRIER</u>	<u>HUBS SERVED</u>
1. AMERICAN Eagle	Air Midwest AVAir Chaparral Command Executive Air Charter Metro Metro Express II Simmons Wings West	Nashville Charlotte Washington Dallas/Ft. Worth Boston New York San Juan Dallas/Ft. Worth Dallas/Ft. Worth Chicago San Francisco Los Angeles
2. CONTINENTAL Commuter	Air New Orleans Gull Rocky Mountain Royale Trans Colorado Mid Pacific	New Orleans Miami Denver Houston Denver Honolulu
3. DELTA Connection	Atlantic Southeast Business Express Comair Rio	Atlanta Memphis Boston New York Cincinnati Dallas/Ft. Worth
4. EASTERN Express	Air Midwest Atlantis Bar Harbor Metro Precision	Kansas City Atlanta Charlotte Boston Miami Atlanta Boston

Air Carrier/Commuter Airlines

Code-Sharing Agreements (Continued)

<u>AIR CARRIER PROGRAM NAME</u>	<u>DESIGNATED COMMUTER CARRIER</u>	<u>HUBS SERVED</u>
5. MIDWAY Connection	Chicago Air Iowa Airways	Chicago Chicago
6. NEW YORK AIR Connection	Colgan Gull Air	Washington Dulles Boston New York
7. NORTHWEST Airlink	Big Sky Fischer Brothers Mesaba	Billings Helena Detroit Minneapolis/St. Paul
8. OZARK	Air Midwest	St. Louis
9. PAN AM Express	Ransome	Washington New York
10. PEOPLE Express	Britt PBA	Chicago Newark/Florida
11. Presidential	Caribbean Express	Miami
12. PIEDMONT Commuter	Britt Brockway Henson Jetstream CCAIR	Dayton Syracuse Baltimore Baltimore Dayton Charlotte
13. RepubLink (REPUBLIC)	Republic Express Simmons	Memphis Detroit Minneapolis/St. Paul

Air Carrier/Commuter Airlines

Code-Sharing Agreements (Continued)

<u>AIR CARRIER PROGRAM NAME</u>	<u>DESIGNATED COMMUTER CARRIER</u>	<u>HUBS SERVED</u>
14. TRANS WORLD Express	Resort Air Resort Commuter	St. Louis Los Angeles
15. UNITED	Air Wisconsin* Aspen Horizon Air* Westair	Chicago Denver Seattle/Portland San Francisco
16. ALLEGHENY Commuter (U.S.AIR)	Air Kentucky Chautauqua Crown Pennsylvania Pocono Southern Jersey Suburban	Louisville Indianapolis Orlando Pittsburgh Pittsburgh Pittsburgh Philadelphia Philadelphia Pittsburgh Philadelphia
17. WESTERN	Sky West	Salt Lake City

* Carrier operates both large jet and small commuter aircraft.

How far the consolidation process will go is open to conjecture. Numerous opinions by industry experts exist as to the number of carriers that will be in existence at various points in time. Certainly, it is believed that there will be substantially fewer regionals/commuters at the end of this forecast report's time horizon than exist today. One estimate is that the industry will be composed of 50 to 60 very large regional carriers. However, the industry has been dominated by the top 50 carriers for a number of years, accounting for over 80 percent of industry traffic. Given recent trends, the total number of commuter/regional airlines will probably decline to fewer than 100 within the time frame of the current forecasts--with as few as 15 to 20 very large regionals accounting for more than 80 percent of total industry traffic.

FORECAST ASSUMPTIONS

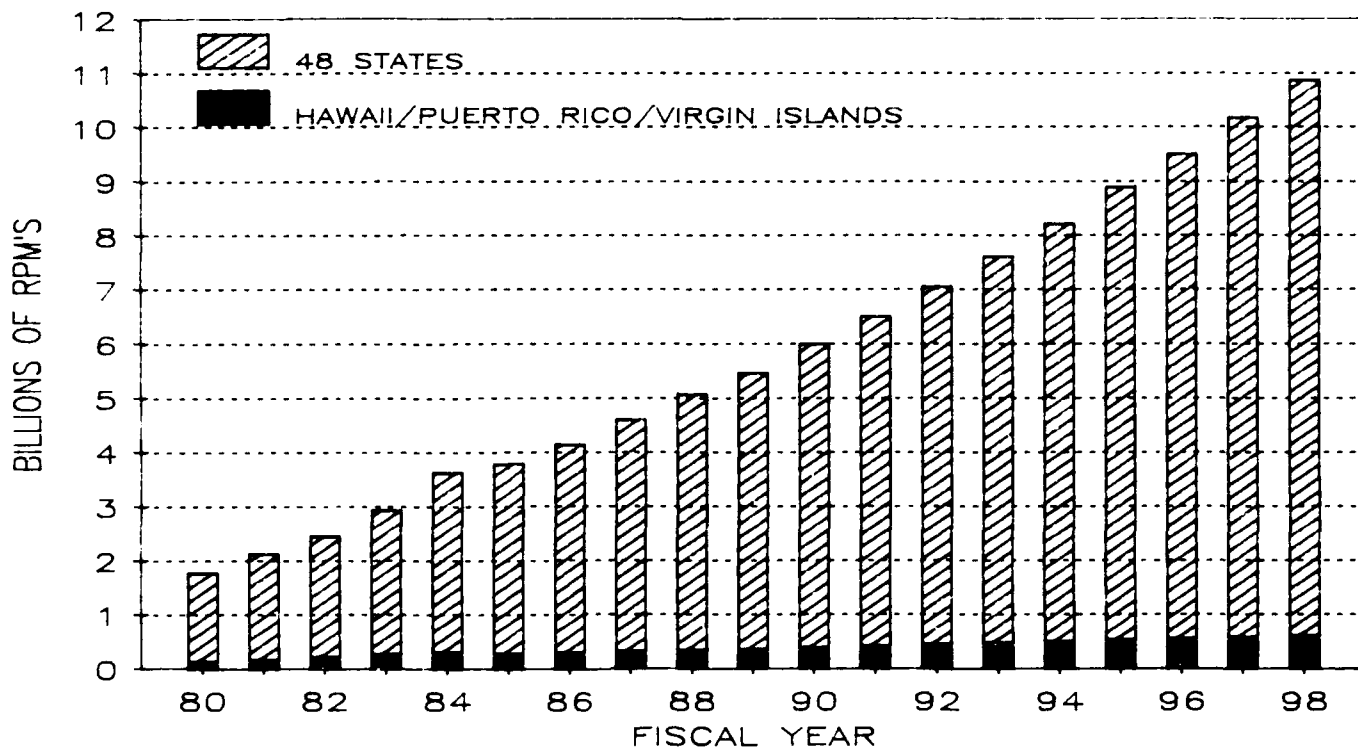
It is expected that the average number of seats per aircraft, the number of aircraft, the number of city-pairs served, and the average passenger trip length will increase over the forecast period. However, it is assumed that the regionals/commuters will continue to serve primarily those markets under 200 miles where they are now concentrated. Future industry growth is expected to come from increased demand placed on a stable, mature commuter airline industry.

REGIONALS/COMMUTERS FORECASTS

Revenue Passenger Miles

Revenue passenger miles are expected to total 10.9 billion in 1998. Passenger miles are projected to increase 10.5 percent in 1987 and 10.2 percent in 1988, and to average 8.3 percent over the 12-year forecast period. In the 48 contiguous states, revenue passenger miles are forecast to total 10.3 billion in 1998, increasing by 11.2 percent in 1987 and 10.3 percent in 1988 and averaging 8.5 percent between 1986 and 1998. Traffic in Hawaii, Puerto Rico, and the U.S. Virgin Islands is forecast to increase by 9.0 percent in 1987 and 8.2 percent in 1988, and to average 6.7 percent over the entire forecast period, totaling 584.1 million passenger miles in 1998.

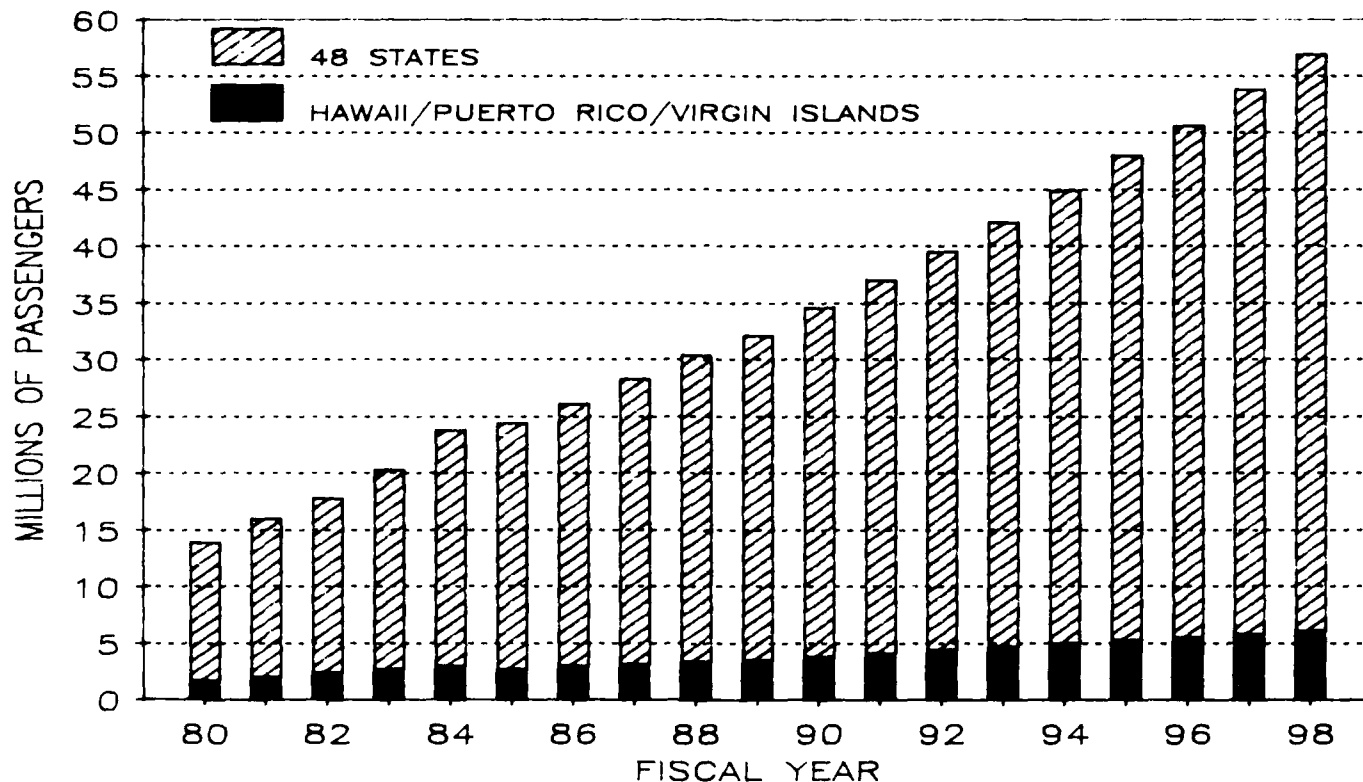
U.S. REGIONALS/COMMUTERS SCHEDULED REVENUE PASSENGER MILES



Passenger Enplanements

Passenger enplanements are forecast to reach 56.9 million in 1998, more than double the 1986 enplanements. Overall, passenger enplanements are expected to increase by 8.4 percent in 1987 and 7.4 percent in 1988, and to average 6.7 percent over the forecast period. In the 48 states, passenger enplanements are projected to increase 9.0 percent in 1987 and 7.1 percent in 1988, and to average 6.7 percent between 1986 and 1998, totaling 51 million in 1998. Passenger enplanements in Hawaii, Puerto Rico, and the U.S. Virgin Islands are expected to total 5.9 million in 1998, growing by 3.6 percent in 1987 and 10.3 percent in 1988, and averaging 6.4 percent over the 12-year forecast period.

U.S. REGIONALS/COMMUTERS SCHEDULED PASSENGER ENPLANEMENTS

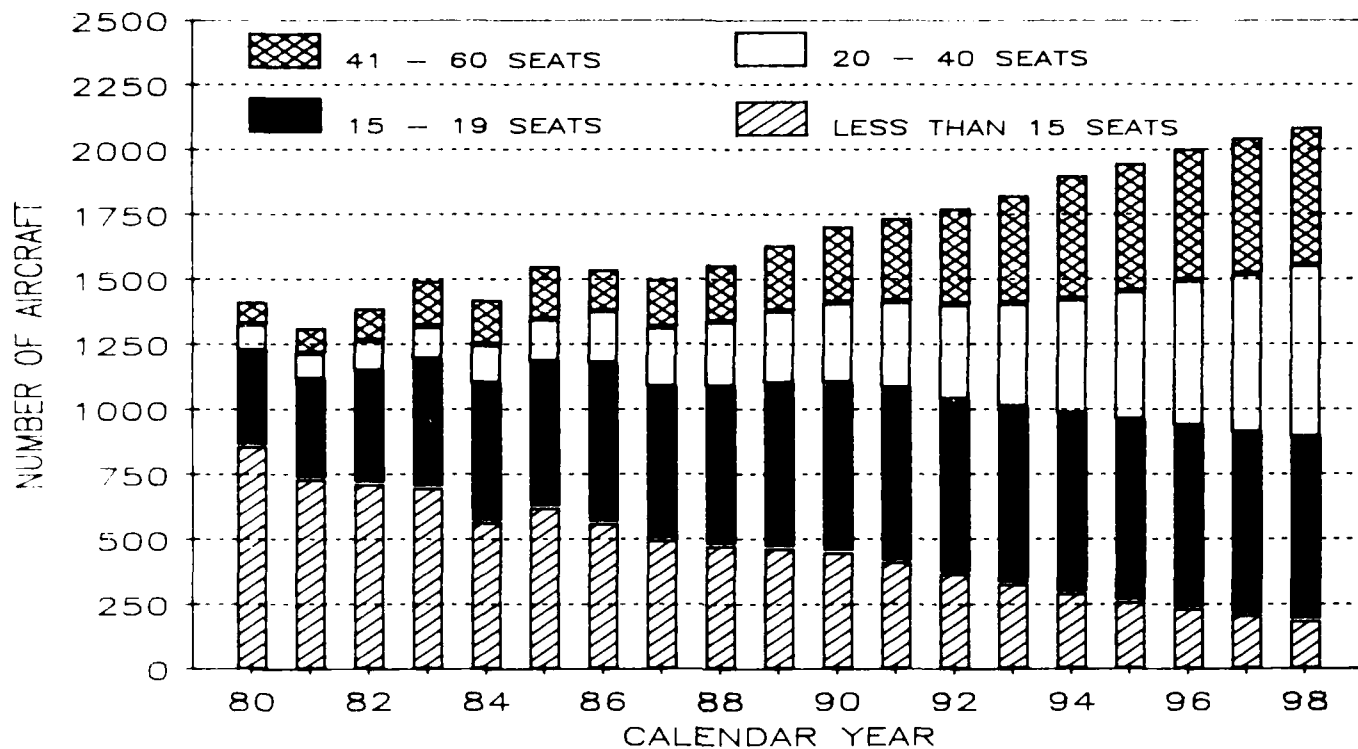


Commuter Fleet

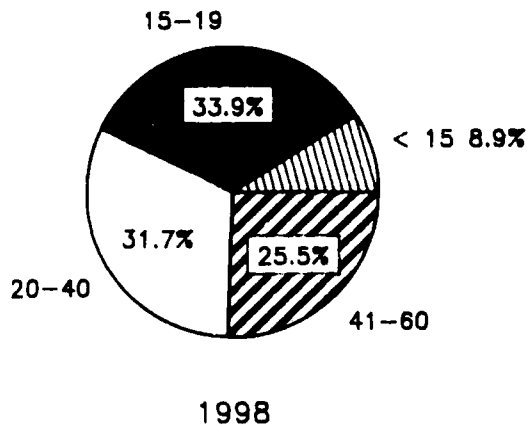
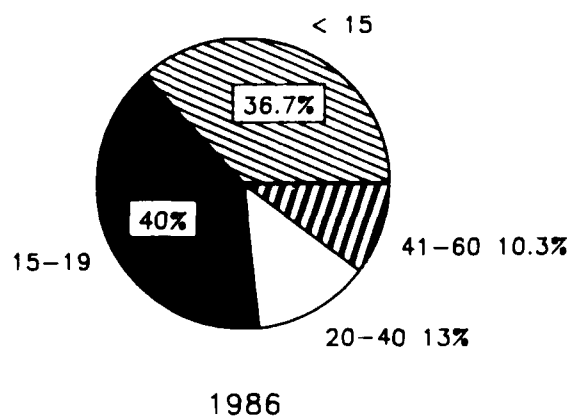
The growth of the regional/commuter airline industry is also reflected in the growth and changing composition of the commuter aircraft fleet. During 1986, the fleet declined just under 1 percent. However, more significant than the marginal decline in total fleet size was the change in composition. While the number of aircraft in the "less than 15 seats" and "greater than 40 seats" categories declined in absolute numbers, this decline was almost completely covered by growth in the "15 to 19 seats" and "20 to 40 seats" aircraft. This change is probably the result of the cessation of operations by many smaller commuters and the conversion by the larger carriers to new, faster aircraft better suited for the markets served through the growing feeder/code-sharing agreements with the large jet operators. Over the forecast period, the fleet is projected to grow at an average annual rate of 3.2 percent through 1998, increasing from 1,538 in 1986 to 2,087 in 1998.

In 1980, aircraft with less than 15 seats accounted for 60.9 percent of the total commuter fleet. By 1986, this category's share of the total fleet had declined to just under 37 percent. This downward trend is expected to continue throughout the forecast period. The number of aircraft in the "less than 15 seats" category is expected to decline by 67 percent between 1986 and 1998, and to account for just under 9 percent of the total fleet in 1998.

U.S. REGIONALS/COMMUTERS PASSENGER AIRCRAFT



PERCENT BY AIRCRAFT SEAT SIZE



The "15-19 seats" category represents the largest portion of the fleet, increasing from 25.8 percent in 1980 to 40 percent in 1986. While this category will continue to account for the largest portion of the fleet throughout the forecast period, its relative share of the total fleet will decline to just under 34 percent in 1998.

The largest growth in the regional/commuter fleet will be in the "20-40 seats" and the "greater than 40 seats" categories. In 1980, these categories accounted for only 7.1 and 6.1 percent of the total fleet, respectively. By 1986, the "20-40 seats" category had increased to 13.0 percent and the "greater than 40 seats" category to 10.3 percent. By 1998, these two categories are expected to account for over 57 percent of the total fleet, 31.7 percent in the "20-40 seats" category and 25.5 percent in the "greater than 40 seats" category. During the forecast period, aircraft in the "20-40 seats" category are expected to increase from 200 aircraft in 1986 to 662 in 1998, an average annual increase of 10.5 percent. Aircraft in the "greater than 40 seats" category are expected to increase from 159 aircraft in 1986 to 532 in 1998, an average annual growth of 10.6 percent. This trend toward larger aircraft will increase the average seating capacity per aircraft from 20.4 seats in 1986 to 28.8 seats in 1998.

Chapter V

General Aviation

The general aviation industry is undergoing deep and broad structural changes. These changes indicate that the long-term growth of the active fleet and activity will be slowing. For the past eight years, general aviation shipments have continuously declined from a peak of 17,811 units in 1978 to 2,029 in 1985. The major independent manufacturers have been taken over by conglomerates, and Cessna and Piper have suspended production of most of their piston-engine aircraft. For the foreseeable future, the large general aviation manufacturers will focus on the production of turbine powered aircraft. Further, a majority of the companies have significantly reduced their work forces and have consolidated plants. The decline in aircraft sales is complemented by decreasing numbers of student and private pilots. Between 1980 and 1985, the number of student pilots declined from 210,200 to 146,652, and the number of private pilots declined from 343,300 to 311,086. Foreign competition both here and abroad has also created problems for the U.S. manufacturers. Foreign producers are making inroads into domestic markets, while exports have been experiencing a protracted period of decline. Exports fell from 3,995 in 1979 to 354 in 1985, a yearly rate of decline close to 33 percent. Ultimately, the shrinking stock of pilots and the slowing in the expansion of the general aviation fleet will reduce the rate of growth of activity at FAA facilities.

General aviation has not responded to the current economic recovery, which has been one of the most robust of the postwar period. Historically, the economic cycle of the general aviation industry has closely paralleled that of the national economy. The theories about the reasons for the decline in sales and pilots are diverse. Some cite high aircraft prices and the availability of low cost alternatives such as ultralights. Others say that high operating costs and interest rates have been responsible for depressing the industry. Still others say that the changes in the tax laws and high product liability costs are responsible. And there are some who feel that the overvalued dollar severely depressed the export market. To be sure, each one of these factors has had some effect. Numerous studies that have been conducted by the Office of Aviation Policy and Plans, by universities, and by the industry have shown that many of the economic factors cited above have outweighed the positive effects of a growing economy.

Although the economics of the industry is important in affecting people's choices, we cannot overlook the fact that we may also be experiencing a fundamental change in the tastes and preferences of the population. This effect, in the long-run, could be more destabilizing and have a larger adverse impact on general aviation than the negative economic factors that have plagued the industry for the past eight years. Changing tastes could upset the fundamental economic equations that have held for many years for the industry. If this phenomenon has occurred, then falling prices, operating costs, and real interest rates, accompanied by economic growth, may not be sufficient to revive the market. As a nation becomes wealthier, households can afford to pay the higher prices of specialized items, and a proliferation of varieties generally takes place. This intensifies the competition in specific types of markets. During the recent strong economic recovery, the demand for recreational flying in conventional aircraft has been rapidly declining, while the demand for relatively expensive cars, homes, and boats has been expanding. This lost market may be difficult to recover even if the economic forces shift in favor of aviation.

REVIEW OF 1986

Fleet Composition and Aircraft Shipments

As of January 1, 1986, the general aviation fleet consisted of 210,655 aircraft, down approximately 5 percent from 1985. For the period 1980 through 1986, the fleet remained relatively constant, growing at an annual rate of only .01 percent. In 1986, the single engine and multi-engine piston fleets were down 4.4 percent and 6.7 percent, respectively. From 1980 through 1986, the single engine piston fleet declined from 168,400 to 164,400, and multi-engine piston aircraft dropped from 25,100 to 23,880. For the same period, the turbine powered fleet increased from 6,200 to 9,800, a yearly rate of growth close to 8 percent. Also during this period, the rotorcraft fleet grew at an annual rate of 2 percent, increasing from 5,800 to 6,400.

Shipments of general aviation aircraft (excluding helicopters, balloons, dirigibles, and gliders) declined approximately 26 percent in 1986. Single engine and multi-engine piston aircraft deliveries fell 28 percent and 29 percent, respectively. Shipments of turboprop aircraft decreased 22 percent, while turbojet aircraft deliveries declined 16 percent.

Hours Flown

Total general aviation hours flown in fiscal 1986 were 33.8 million, down 6.6 percent from fiscal 1985. Single engine piston aircraft accounted for 66.0 percent of all hours flown, multi-engine piston aircraft for 14.0 percent, turbine powered aircraft for 11.0 percent, and rotorcraft for 7.1 percent. The single engine piston aircraft hours flown declined 4.3 percent in 1986, while turbine powered aircraft hours declined 13.6 percent, and rotorcraft hours increased 4.3 percent. During the period 1980 through 1986, total hours flown declined at an annual rate of 3.4 percent, single engine piston aircraft hours flown declined at a rate of 4.1 percent, turbine powered aircraft hours grew at a 1.9 percent rate, and rotorcraft hours flown declined at a rate of 1.9 percent.

In calendar 1985, personal and instructional use accounted for 37 percent of all hours flown, and business and executive use for 31 percent. In 1970, personal and instructional use accounted for over 50 percent of all hours flown, and business and executive for only 28 percent. Between 1970 and 1985, the use of general aviation for business grew at a 2.5 percent annual rate, while personal and instructional use declined at a rate of approximately 1 percent a year.

Pilot Population

The declining numbers of student and private pilots provide further evidence of general aviation's changing characteristics. As of January 1, 1986, the total pilot population was 709,540, down 1.8 percent from 1985. The current level is 14 percent below the maximum pilot population of 827,071 reached in 1981. For the period 1980 through 1986, the total active pilot population declined at a yearly rate of 2.3 percent. In 1986, private and student pilots were both down from 1985. Private pilots declined 2.8 percent, and student pilots fell 2.3 percent. From 1980 through 1986, student pilots dropped from 210,180 to 146,652, a yearly rate of decline of 5.8 percent. Private pilots fell from 343,276 to 311,086, a yearly rate of decline of 1.6 percent.

DISCUSSION OF STRUCTURAL CHANGES

An indication that fundamental changes have taken place in the industry is the failure of aircraft shipments to respond to an expanding economy. During previous economic cycles, changes in the general aviation industry have generally paralleled changes in business activity. Empirical results have shown that on the average a 1 percent increase in GNP, adjusted for price changes, will increase general aviation unit shipments by about 4.2 percent. However, since the long, precipitous decline of aircraft shipments began in 1979, this expected result has not occurred. For example, in 1979 real GNP increased 2.8 percent, and shipments declined 4.3 percent. Again in 1981, real

GNP increased 2.6 percent, while shipments declined 21 percent. In 1983, which was an especially good year for the economy, GNP increased 3.4 percent and unit shipments fell 37 percent. In 1984, deliveries dropped 10 percent, while aggregate output of the economy increased an impressive 6.8 percent; and, in 1985 sales fell 17 percent, while GNP rose 2.7 percent. Although 1986 has shown strong growth, shipments continue to fall below 1985 levels. This relatively long run of declining production and increasing real GNP implies that other variables are outweighing the positive effects of income growth. It would not be expected that this persistent pattern would be due to chance alone. Factors such as the availability of low cost alternatives for recreational flying, changes in tastes and preferences, declining student and private pilots, rapidly rising prices and operating costs of conventional aircraft, and continued high real interest rates may all be contributing to the downturn. In the following sections, trends in the major economic forces affecting aircraft sales, exports, and pilots are presented along with an analysis of aircraft prices.

Single Engine Piston Aircraft

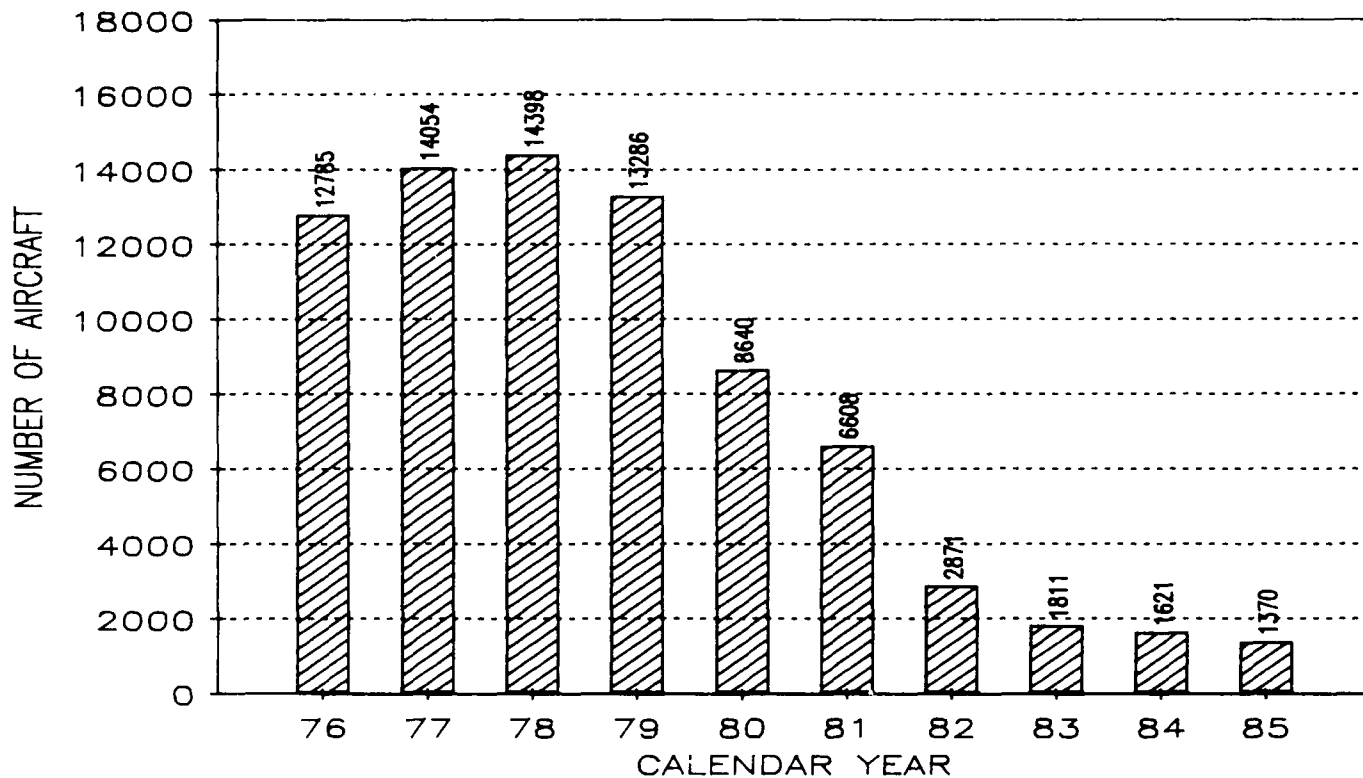
During the 1970's, single engine piston aircraft shipments increased at a steady rate, peaking in 1978 at 14,398 units. From 1978 through 1985, shipments continuously fell to 2,029, a yearly rate of decline of 27 percent. During this period of declining shipments, single engine piston aircraft prices increased at a yearly rate close to 11 percent. Real prices grew 5 percent a year, which is also substantial. The largest price increases occurred from 1980 through 1984. Prices during this period increased about 14 percent a year. Prices in 1985 increased 4 percent over 1984, and prices in 1986 increased approximately 7 percent. Operating and maintenance costs, particularly operating costs, have also been rising faster than the rate of inflation. From 1979 through 1983, fuel prices significantly increased due to the run up in OPEC oil prices in 1979. However, since 1984 prices have begun to decline, but at a relatively slow rate. The failure of general aviation gasoline and jet fuel prices to decline as rapidly as oil prices and the prices paid by commercial air carriers for jet fuel could be due to the desire of fixed base operators to maintain income levels in a shrinking market. Revenue from gasoline markups is generally used to pay for other services provided by the fixed base operator. When the amount of fuel sold decreases, the markup per gallon has to increase to pay these other costs.

Multi-Engine Piston Aircraft

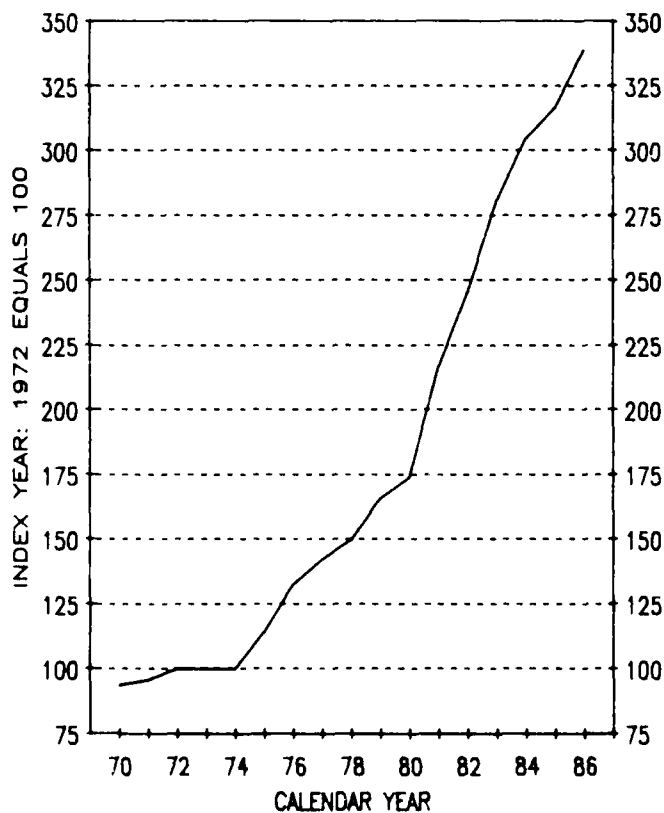
Shipments of multi-engine piston aircraft have followed a pattern similar to those of single engine piston aircraft. Shipments were strong throughout the 1970's, peaking in 1979 at 2,843 units. The average number of units shipped between 1970 and 1979 was 2,020. In 1985, only 193 aircraft were shipped, a decline of 93 percent from the peak in 1979. During the period of declining shipments, annual price increases were over 10 percent. Prices, adjusted for inflation, increased at a rate close to 5 percent. The growth of operating and

SINGLE ENGINE PISTON AIRCRAFT TRENDS

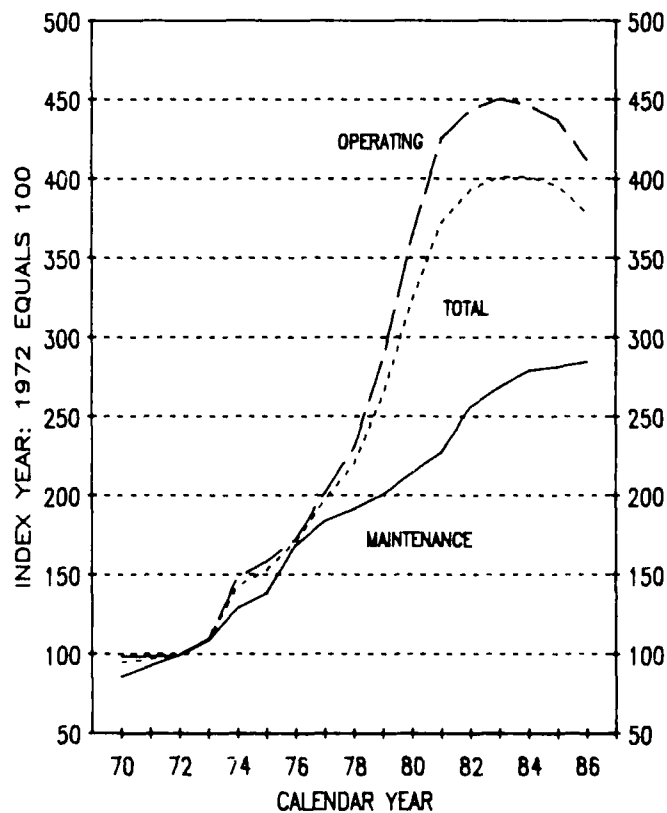
AIRCRAFT SHIPMENTS



AIRCRAFT PRICES

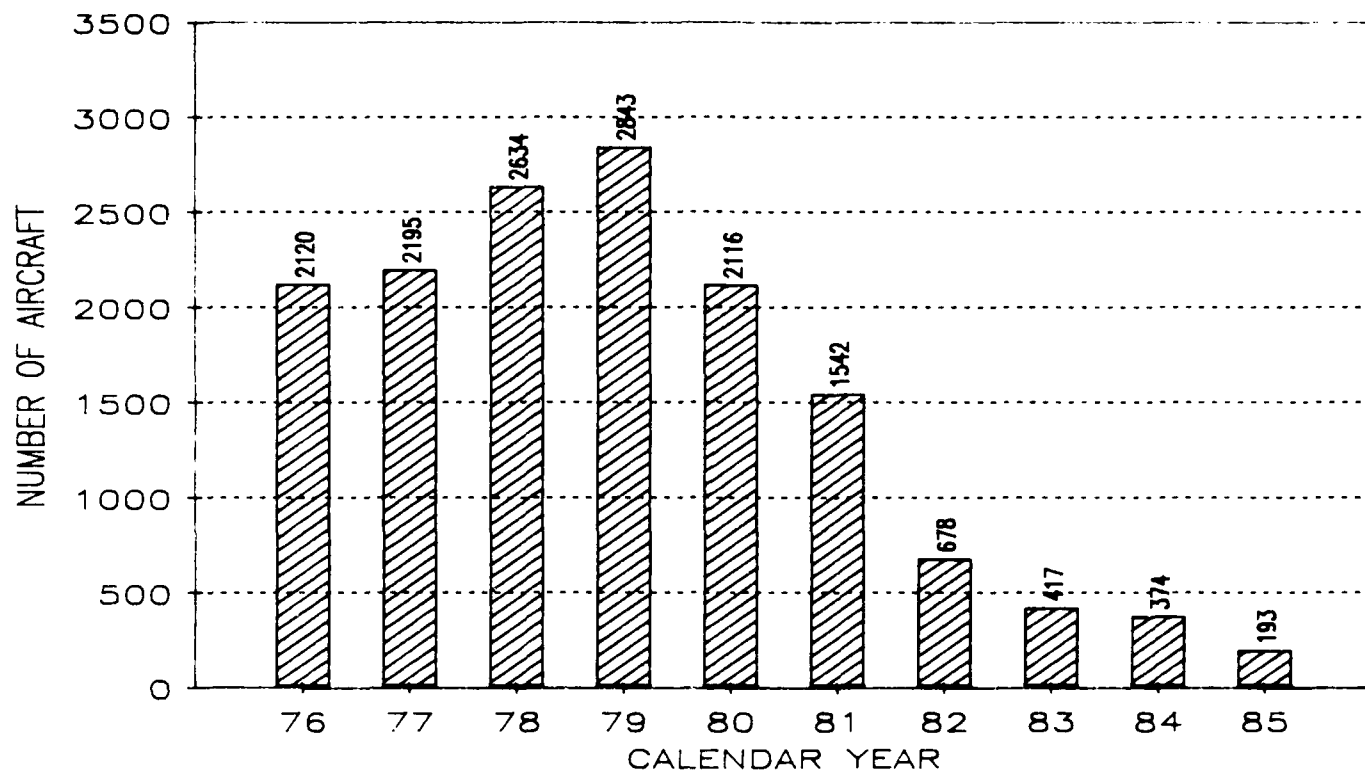


OPERATING AND MAINTENANCE COSTS/HOUR

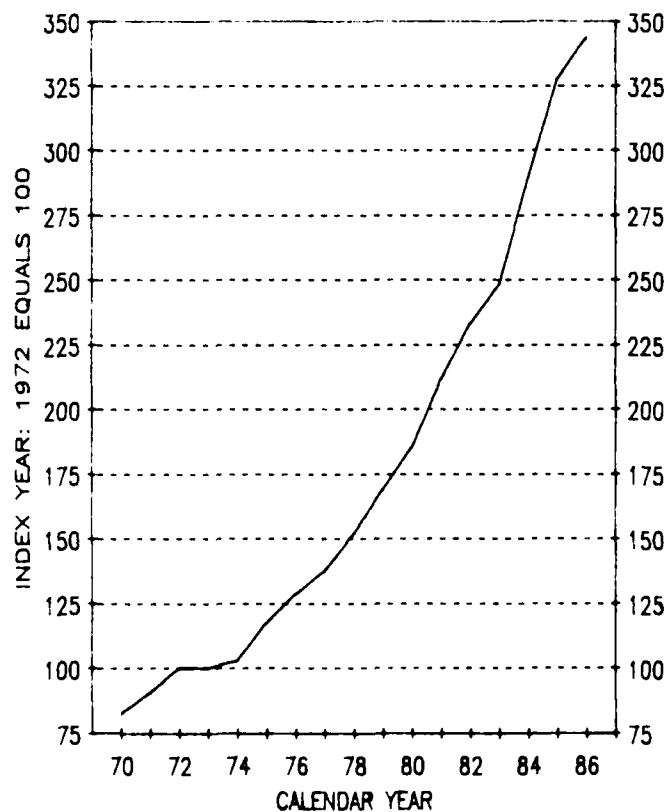


MULTI-ENGINE PISTON AIRCRAFT TRENDS

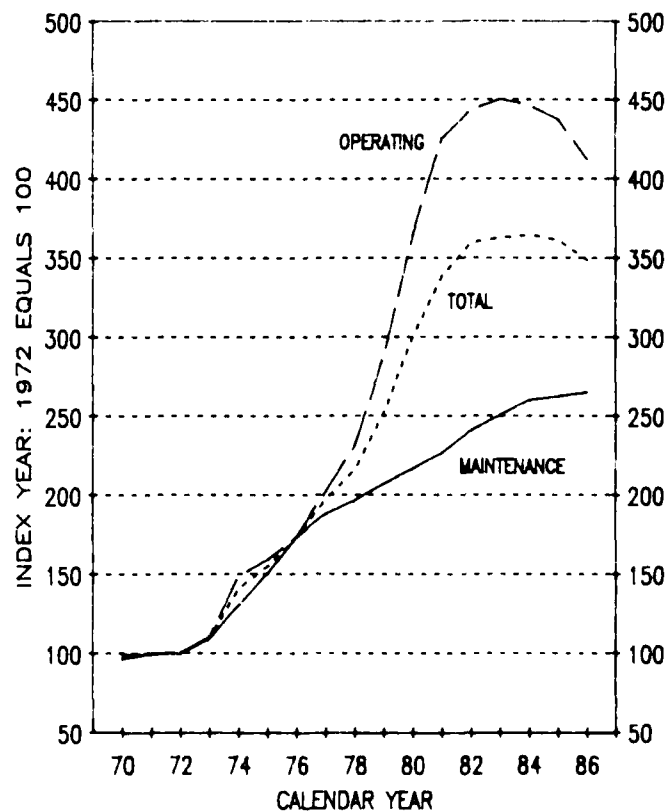
AIRCRAFT SHIPMENTS



AIRCRAFT PRICES



OPERATING AND MAINTENANCE COSTS/HOUR



maintenance costs during the 1970's and 1980's was also significant. For the period 1970 through 1986, operating and maintenance costs increased at a yearly rate of 8.3 percent; real costs increased at an annual rate of about 3 percent. The relative importance of operating costs and maintenance costs can be discerned by calculating independent growth rates for these two series. For the period 1970 through 1986, maintenance costs increased at a yearly rate of 6.5 percent, while operating costs, which are predominantly fuel costs, increased at a yearly rate of 9.4 percent. Clearly, the large increases in operating and maintenance costs are attributable to fuel price changes.

Turboprop Aircraft

The piston market has not been the only segment of general aviation that has been experiencing a protracted recessionary period. The demand for the larger, more sophisticated aircraft by business, which was expected to be strong throughout the 1980's, has been relatively weak for the past 6 years. The expectations for sustained strong growth were formed during the 1970's when shipments of turboprop aircraft were expanding at an exceptional rate. In 1971, 89 turboprop units were shipped. Shipments continued increasing throughout the 1970's, reaching a maximum of 918 units in 1981. The average yearly growth rate of shipments during this period was 26 percent. The rapid decline of shipments began in 1982. Deliveries reached a level of only 321 units in 1984, approximately equal to the number of units shipped in 1976. Between 1979 and 1986, prices accelerated, increasing at an annual rate of 8 percent. Real prices increased at a 3 percent yearly rate. Operating and maintenance costs also showed large increases during the latter part of the 1970's and early 1980's.

Turbojet Aircraft

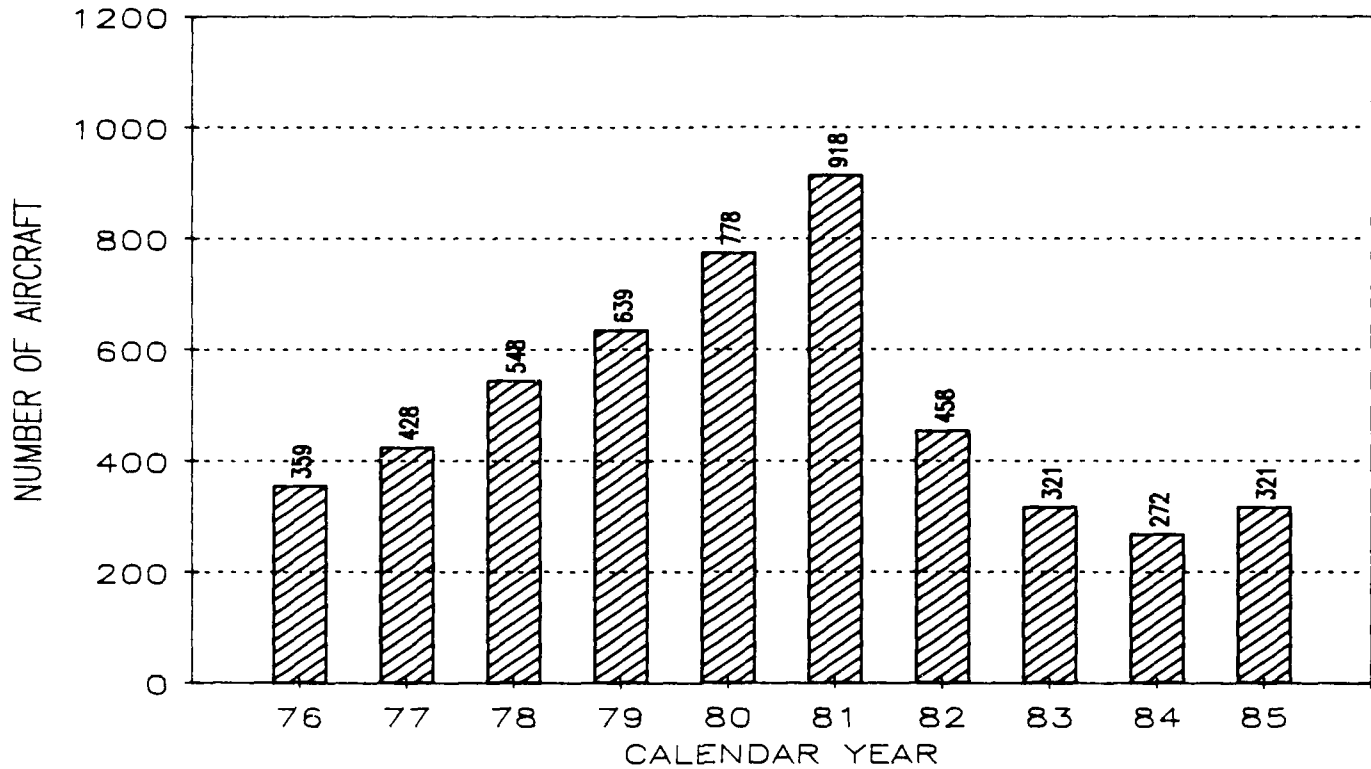
Shipments of turbojet aircraft were 47 in 1971, reached a maximum of 389 in 1981, and then fell to 145 in 1985. This pattern is similar to that for the turboprop aircraft, rapidly increasing shipments during the 1970's, followed by a steep decline in the 1980's. During the growth period, shipments were increasing at an annual rate of over 24 percent. During the period of decline, shipments fell at an annual rate of approximately 22 percent. From 1979 through 1986, prices increased at a yearly rate of 8.7 percent, while real prices increased at a rate of 3.0 percent. Operating and maintenance cost movements paralleled those of the other aircraft previously discussed, increasing during the latter part of the 1970's and early 1980's, and then declining during the past three years, but not as fast as the decline in crude oil prices.

Exports

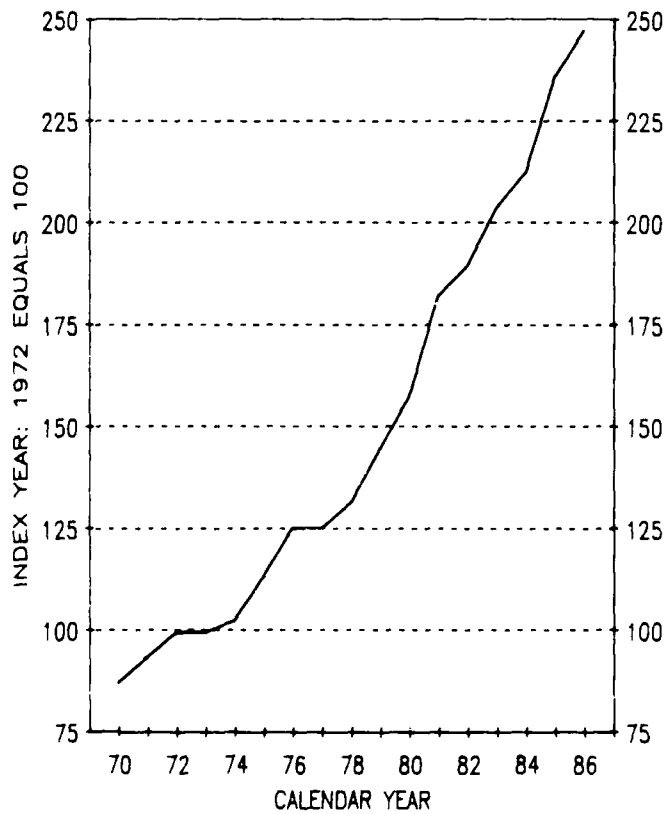
Foreign sales have also weakened during the past several years. Exports dropped from 3,995 units in 1979 to 354 in 1985, a yearly rate of decline of approximately 33 percent. Further, net billings from exports declined from \$756.4 million in 1980 to \$230 million in 1985. Recent analyses have shown

TURBOPROP AIRCRAFT TRENDS

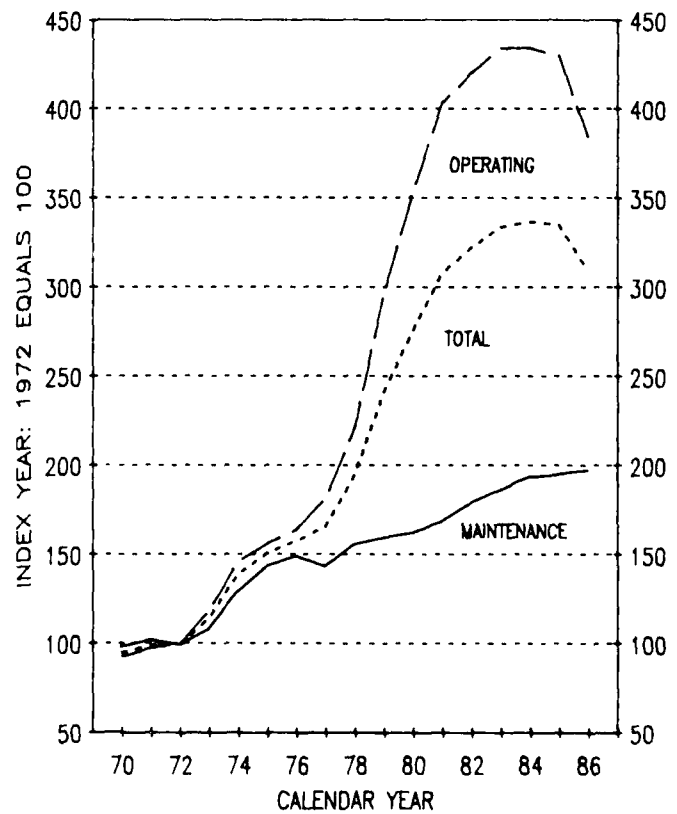
AIRCRAFT SHIPMENTS



AIRCRAFT PRICES

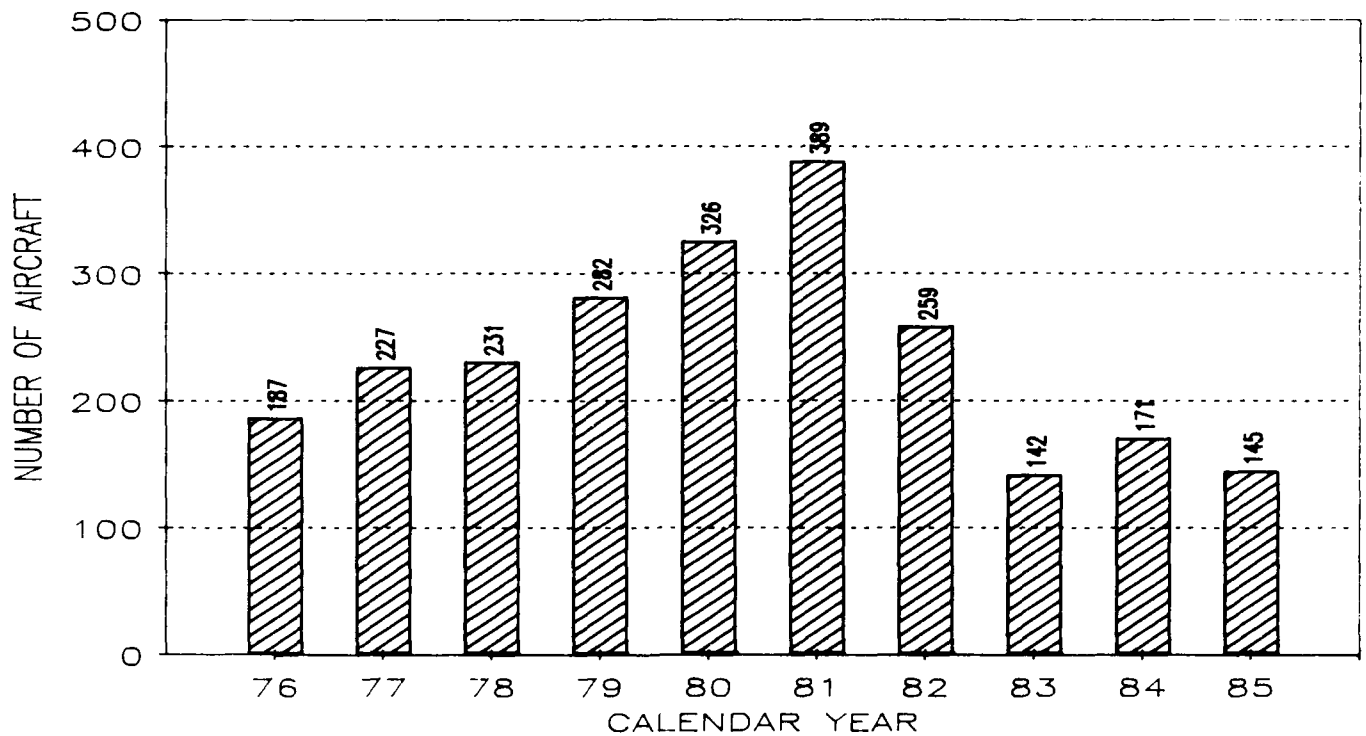


OPERATING AND MAINTENANCE COSTS/HOUR

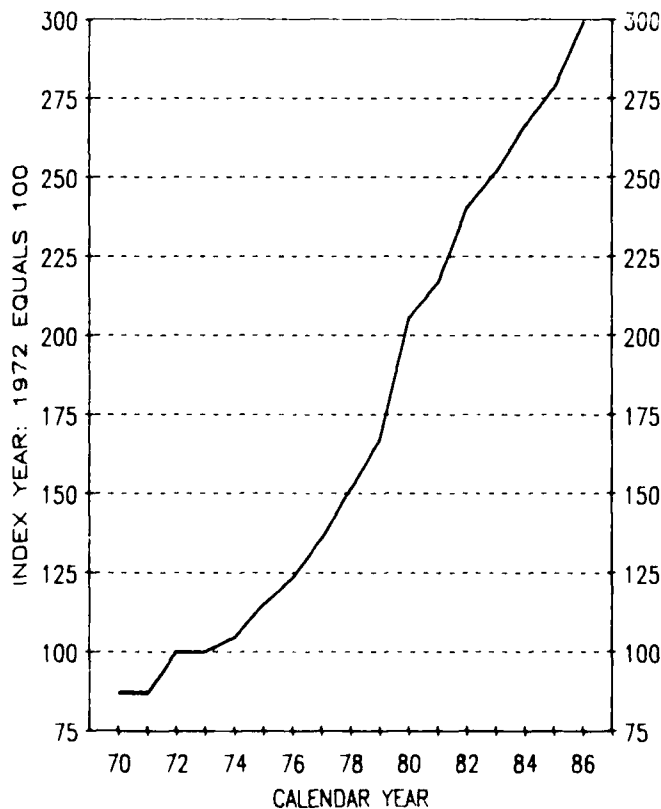


TURBOJET AIRCRAFT TRENDS

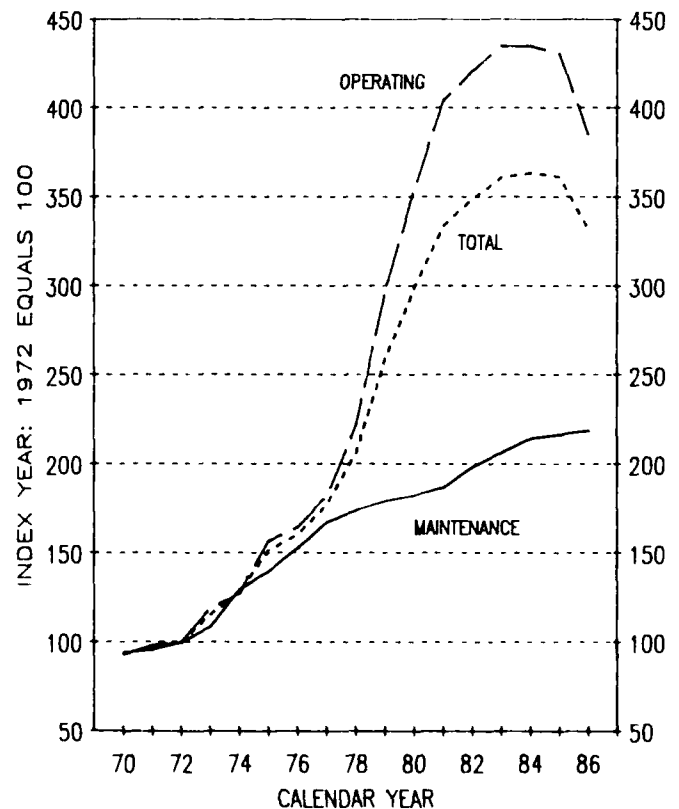
AIRCRAFT SHIPMENTS



AIRCRAFT PRICES



OPERATING AND MAINTENANCE COSTS/HOUR



that prices of aircraft, the exchange rate, and world gross national product explain a large percentage of the variability in exports. In addition, the analyses indicated that relatively small increases in prices and the exchange rate will have a large negative impact on the foreign market.

Aircraft Price Analyses

Numerous studies during the past few years have shown that accelerating aircraft prices and operating and maintenance costs during the latter part of the 1970's and throughout the 1980's have had a dampening effect on domestic and international sales. Insights have been made into the reasons for the continued high operating costs. It was pointed out earlier that fuel prices have not declined as quickly as crude oil prices because of the desire of fixed base operators to maintain income levels in a shrinking market. In analyzing the underlying causes of price increases, however, inferences could only be made from a very limited data base. Data on the costs of aircraft production are unavailable. A breakdown of the costs of production over a relatively long time period is essential for isolating the factors that have been responsible for the recent escalation of prices.

To determine if rising labor costs have been responsible for price increases, the growth rate of wage rates of fabricated metal workers were compared to the growth rate of prices for the period 1972 through 1986. Prior to the period of accelerating prices, wages and prices were highly correlated. Further, prices were increasing at a slower rate than wages. In general, a 1 percent increase in the wage rate resulted in a price increase of less than 1 percent. These results imply that during this period productivity in the industry was increasing. When aircraft prices began to accelerate, wage rates also continued to increase, but at a much slower rate. The reversal of the growth rates of wages and prices suggests that factors such as rising product liability costs, increasing avionics costs, declining productivity, and industry pricing policies may be responsible for the recent escalation of prices. For example, between 1972 and 1977, single engine piston aircraft prices increased at a yearly rate of 7.6 percent, while wages increased at a yearly rate of 9.1 percent. During the period 1977 through 1986, prices grew at a yearly rate of 10.1 percent, while wages grew at an annual rate of only 6.0 percent.

To assess the relationship between aircraft and avionics prices, time series of prices for 4 types of equipment and general aviation aircraft were compared. Between 1974 and 1979, avionics prices generally increased at slower rates than aircraft prices. However, during the 1980's, avionics prices have been increasing at relatively faster rates. For example, for the period 1974 through 1979 general aviation aircraft prices increased at an average annual rate of 9.7 percent, while VHF navigation equipment prices increase at a 1.9 percent rate. Between 1979 and 1986, aircraft prices increased at a yearly rate of 10.7 percent, while VHF navigation equipment prices increased at an annual rate of 15.3 percent.

AIRCRAFT PRICES AND WAGE RATES
AVERAGE YEARLY GROWTH RATES

<u>Aircraft Type</u>	<u>Yearly Growth Rates</u> (Percent)	
	<u>1972-1977</u>	<u>1977-1986</u>
<u>Single Engine Piston Aircraft</u>		
Prices	7.6	10.1
Wage Rates	9.1	6.0
<u>Multi-Engine Piston Aircraft</u>	<u>1972-1979</u>	<u>1979-1986</u>
Prices	8.2	10.7
Wage Rates	8.6	5.4
<u>Turboprop Aircraft</u>	<u>1972-1980</u>	<u>1980-1986</u>
Prices	5.2	7.8
Wage Rates	9.2	4.4
<u>Turbojet Aircraft</u>	<u>1972-1979</u>	<u>1979-1986</u>
Prices	7.6	8.7
Wage Rates	8.9	5.4

AIRCRAFT AND AVIONICS PRICES
AVERAGE YEARLY GROWTH RATES

<u>Aircraft and Avionics</u>	<u>Yearly Growth Rates</u> (Percent)	
	<u>1974-1979</u>	<u>1979-1986</u>
General Aviation Aircraft Prices	9.7	10.7
VHF Navigation Equipment Prices	1.9	15.3
VHF Communications Equipment Prices	1.0	15.1
Transponder Prices	9.2	11.2
Distance Measuring Equipment Prices	2.2	10.4

Pilot Trends

The continuing decline in the numbers of student and private pilots provides further evidence that structural changes are occurring in general aviation. These trends will also contribute to the slowing of activity at FAA facilities. For the period 1979 through 1985, student pilots fell from 210,000 to 146,700, a decline of 6 percent a year. During the 1960's and 1970's, the number of student pilots generally followed changes in economic activity. This pattern, however, has not occurred in the 1980's. Periods of robust economic growth have not been accompanied by a resurgence of pilot training. Rapidly rising training costs, aircraft prices, and operating and maintenance costs are partly responsible for this phenomenon. A fundamental change may be occurring in the tastes and preferences of consumers for flying. In the long-term, this could have a far greater impact on the market than the real growth of aircraft prices and operating costs. A declining population of students and an accelerating attrition rate of private pilots have reduced the total number of private pilots over the last 5 years. From 1980 to 1985, total active private pilots fell from 357,479 to 311,100, a yearly rate of decline of about 3 percent. Although the downward trends in the pilot populations are expected to turn around by the early 1990's, slow growth is anticipated for the remainder of the forecast period.

GENERAL AVIATION FORECASTS

Hours Flown

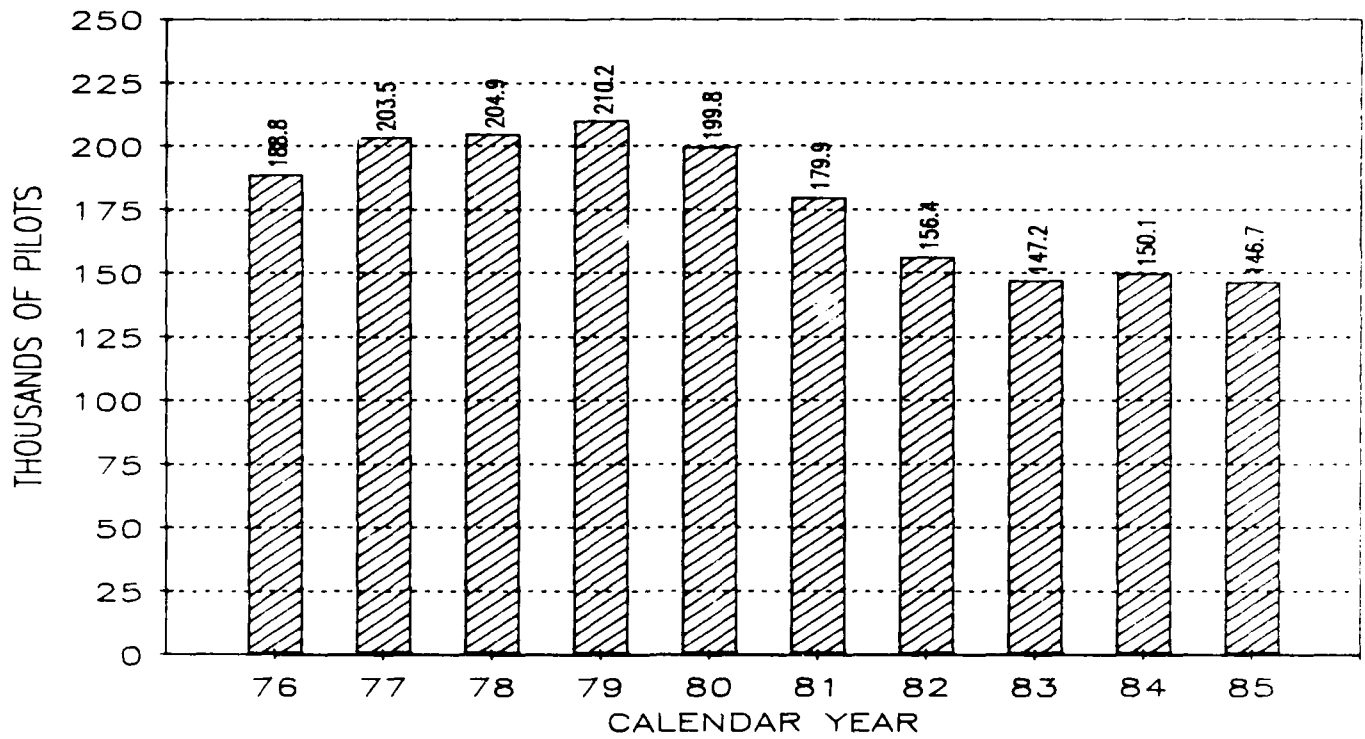
Growth over the entire forecast period for general aviation hours is expected to average only 0.7 percent a year, resulting in an estimated 36.8 million hours flown in 1998. During the 1960's and 1970's, the average annual growth rate of hours flown was about 6 percent. Single engine piston aircraft hours flown is forecast to decline from 22.4 million hours in 1986 to 22.1 million in 1998. Turbine powered aircraft hours flown is projected to increase from 4.8 million in 1986 to 5.6 million in 1998, growing at the rate of 3.3 percent a year. Turbine rotorcraft hours flown is expected to increase at a yearly rate of 4.6 percent.

Fleet

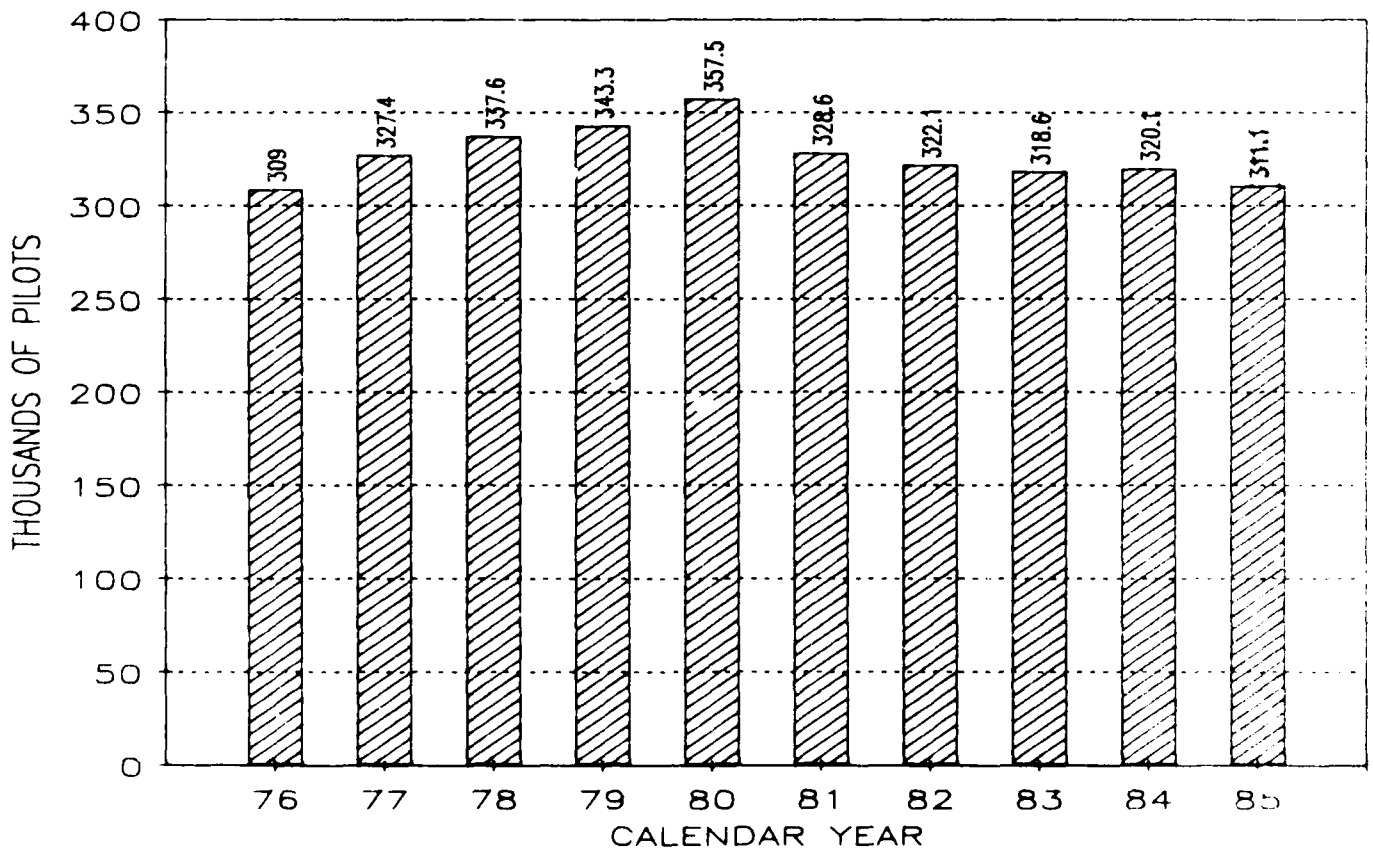
The active general aviation fleet will decline through 1992, and then grow slowly for the remainder of the forecast period. The population of active aircraft is forecast to increase 0.3 percent a year between 1986 and 1998. Active single engine piston aircraft is projected to decline at an annual rate of 0.1 percent, falling from 164,500 in 1986 to 162,500 in 1998. The number of multi-engine piston aircraft is expected to decline through 1992, and then to increase at about 100 aircraft per year until the total reaches the present level of 23,800. Turbine powered aircraft is projected to increase from 9,800 in 1986 to 14,700 in 1998, growing at the rate of approximately 3.4 percent a year. The forecast of the turbine rotorcraft fleet shows a yearly rate of increase of 5.3 percent.

ACTIVE PILOT TRENDS

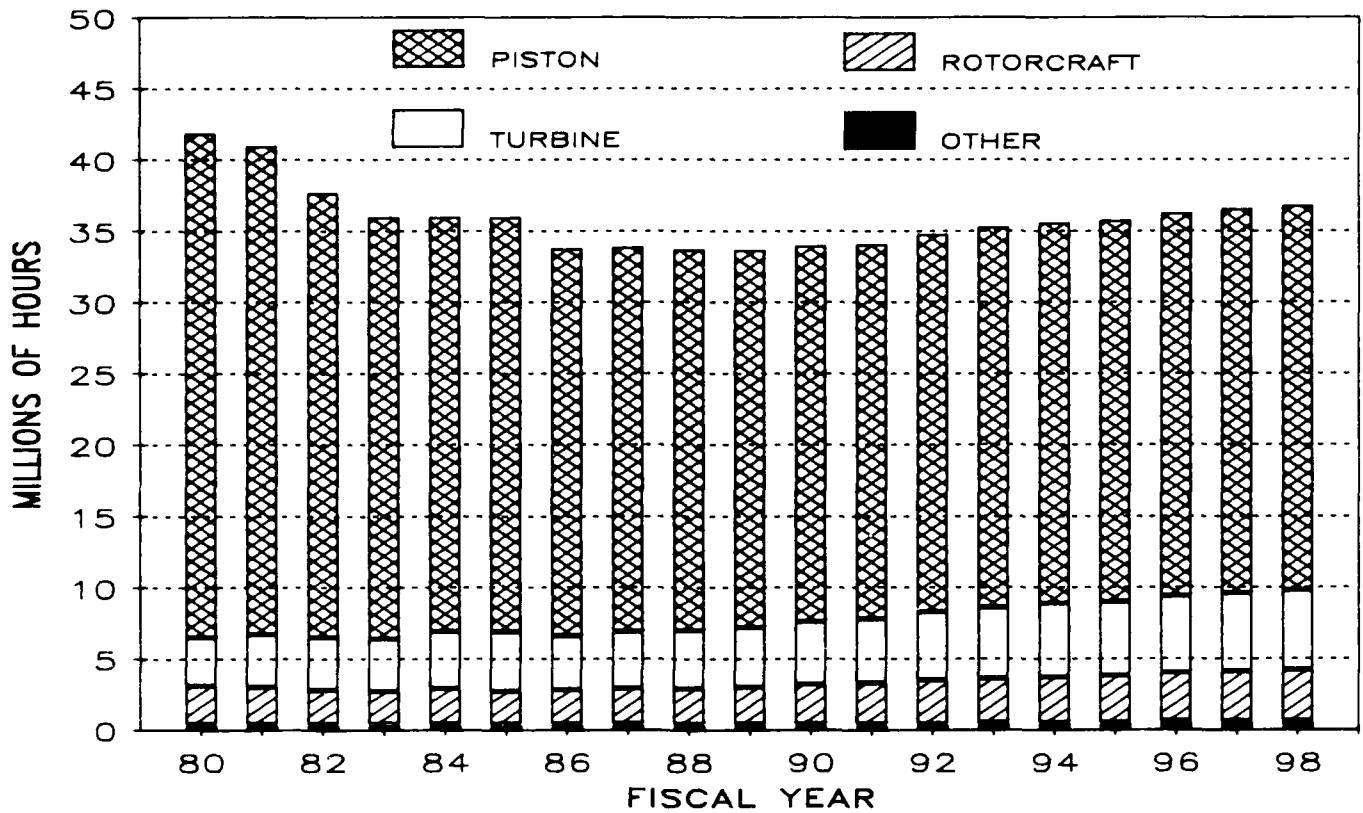
STUDENT PILOTS



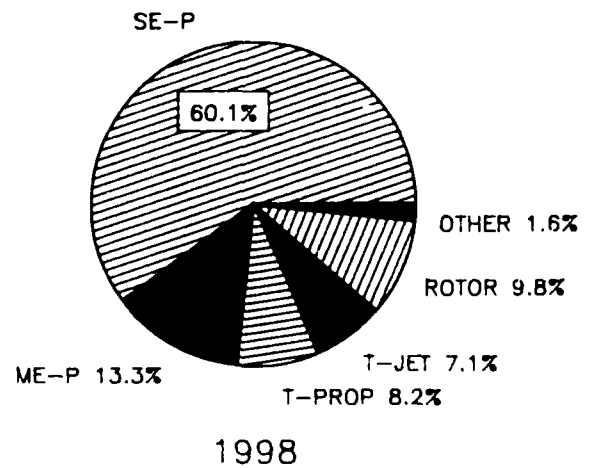
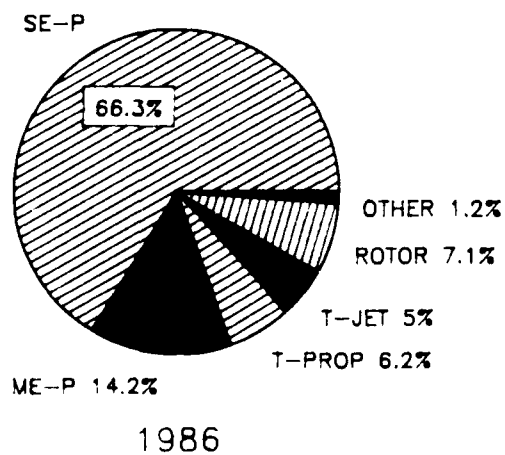
PRIVATE PILOTS



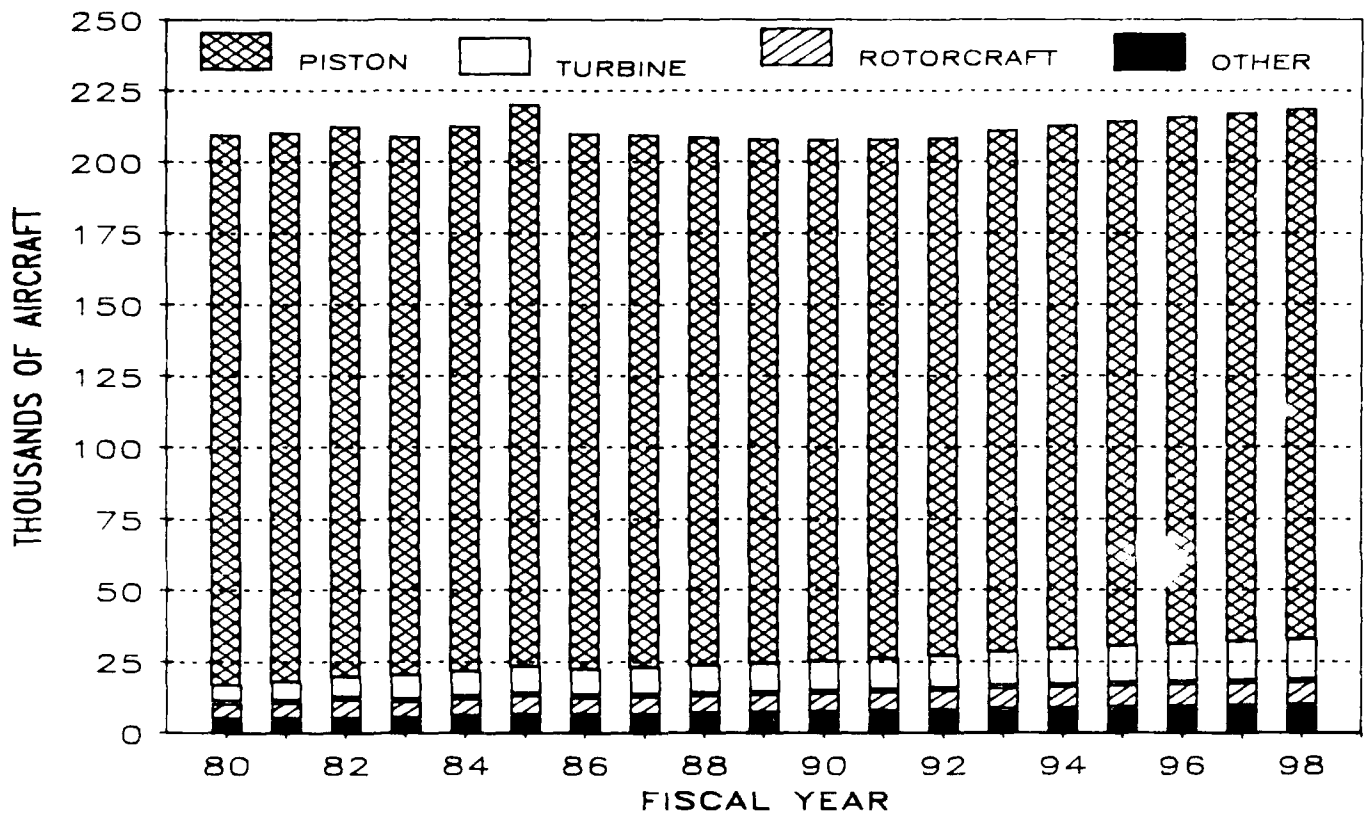
GENERAL AVIATION HOURS FLOWN



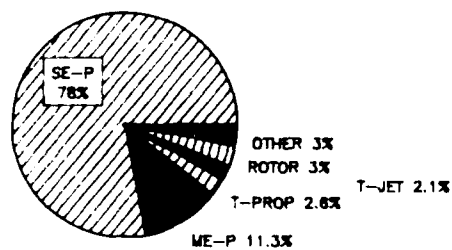
PERCENT BY AIRCRAFT TYPE



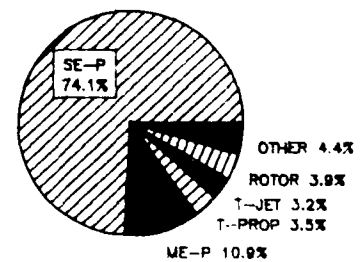
ACTIVE GENERAL AVIATION AIRCRAFT



PERCENT BY AIRCRAFT TYPE



1986



1998

Chapter VI

Helicopters

REVIEW OF 1986

Shipments

Preliminary data for calendar year 1986 indicate that shipments of U.S. civil helicopters will total 301, a 20 percent decrease from the level of 376 helicopters shipped in 1985. The value of the 1986 shipments equals \$273 million compared with \$505 million in 1985, a 46 percent decrease. Exports of civil helicopters increased to \$260 million; imports totaled \$49 million. Accordingly, production for export in the helicopter industry made a net contribution of \$211 million in reducing the trade deficit, \$46 million more than the contribution made in 1985 (\$165 million). Helicopter shipments have declined considerably since the 1980 level of 1,366 units. Recovery in the industry tends to lag behind the expansion phase in the national economy. Thus, the recessionary conditions observed in the helicopter industry in preceding years continued in 1986 also. Key factors responsible for the relatively depressed state of the industry include continued low levels of offshore oil operations, inherently high operating costs, and (with the possible exception of the New York/New Jersey area) failure of helicopter airlines to penetrate passenger markets. In addition, a number of operators have been upgrading their helicopter fleets with units that out-perform their predecessors in range, speed, and capacity. The net effect of such upgrading is a gain in efficiency; fewer helicopters can perform a greater number and variety of tasks than those performed prior to upgrading. The end result, however, is that the anticipated rebound in the civil helicopter industry failed to materialize except in areas such as emergency medical services and in police and weather related work where demand continues to be steady.

Fleet and Hours Flown

As of January 1, 1986, there were approximately 6,500 active civil rotorcraft in the U.S., about 8.5 percent lower than the 7,100 active helicopters indicated in January 1985. Year-to-year fluctuations in the active rotorcraft fleet are the combined results of economic conditions and statistical estimating procedures. During recessionary periods, for example, helicopter units which tend to be used marginally during economic growth and recovery conditions are relegated to the inactive category. Such shifts are

responsible, in part, for the observed variations in the active fleet. Turbine helicopters numbered 3,600 in 1986, approximately 55 percent of the active fleet. The proportion of active turbine helicopters declined slightly in 1986 relative to the proportions for 1984 and 1985 (62 and 59 percent, respectively). By comparison, the number of active piston-powered rotorcraft remained the same (2,900 units) in 1986 as in 1985. Although the number of piston-powered helicopters increased in 1984 and 1985, the number has not climbed to the peak of 3,300 observed in 1982.

Rotorcraft flew an estimated 2.4 million hours in 1986. Turbine-powered rotorcraft flew 1.8 million hours, 75 percent of the total number of hours flown. Since 1982, hours flown in turbine-powered rotorcraft have remained relatively constant (between 74 and 76 percent). In 1980, turbine-powered rotorcraft hours flown accounted for 67 percent of all rotorcraft hours flown.

HELICOPTER FORECASTS

The forecasts of rotorcraft fleet and hours flown presented in this section represent a consensus of results derived from econometric models, time series analysis, and industry projections. The results were adjusted to account for recent benchmark data for calendar year 1985 and for recent and anticipated economic conditions in the industry.

Fleet and Hours Flown

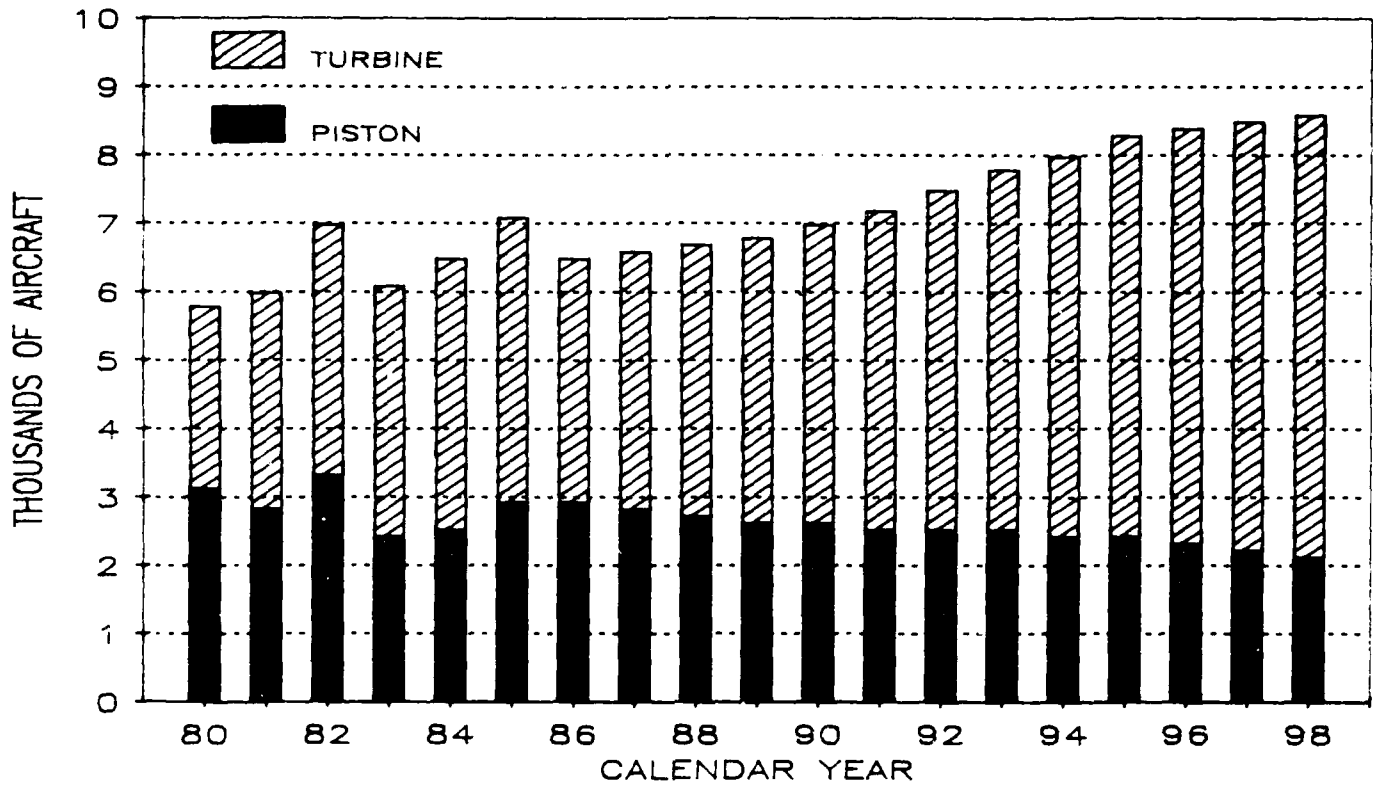
The active rotorcraft fleet is expected to reach 8,600 in 1998, an annual average increase of 2.4 percent over the 1986 level. In 1998, the turbine-powered portion of the fleet will number 6,500. This portion of the fleet will increase to nearly 76 percent from the 1986 proportion of 55 percent. The piston-powered fleet will decrease to 2,100 from its current level of 2,900 helicopters.

The growth in the fleet will be accompanied by growth in hours flown, which will reach 3.6 million in 1998. This represents an annual average growth of 3.4 percent. Similarly, hours flown by turbine-powered helicopters will increase by over 72 percent and will reach 3.1 million by 1998. In contrast, hours flown by piston-powered rotorcraft will remain virtually unchanged during the forecast period.

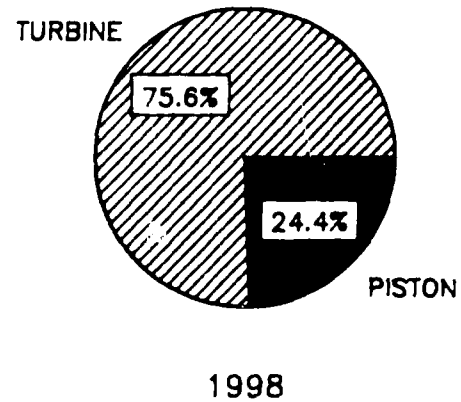
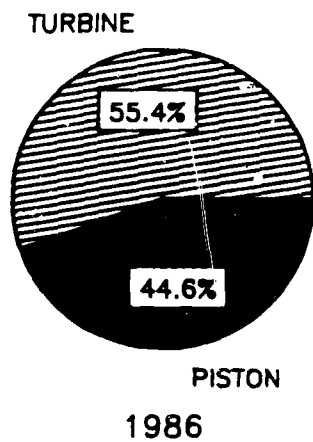
Fuel Consumed

In 1986, fuel consumed by rotorcraft totaled 70.3 million gallons. By 1998, fuel consumed will increase to 115.6 million gallons, an average annual increase of 4.2 percent. Nearly 94 percent of the fuel consumed in 1998 will be used by turbine-powered rotorcraft, compared with about 88 percent in 1986.

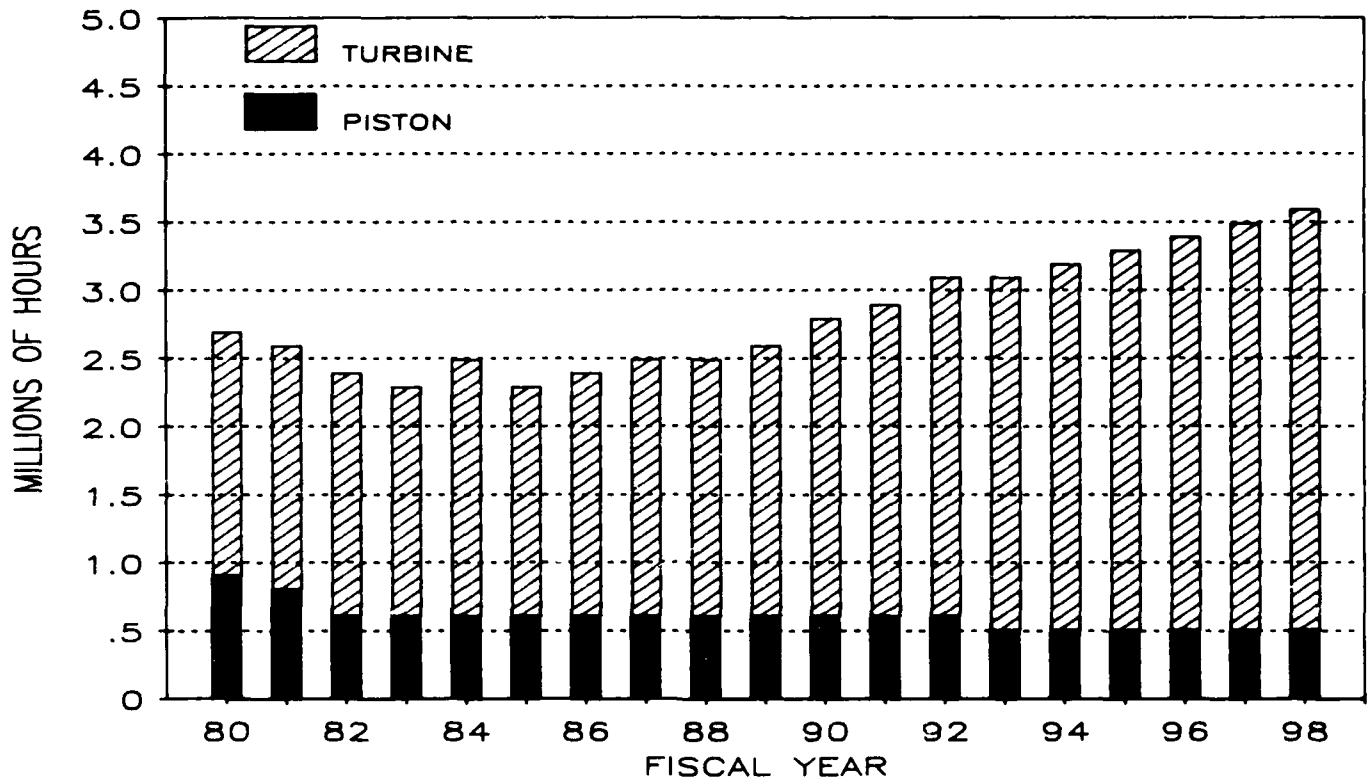
ACTIVE ROTORCRAFT



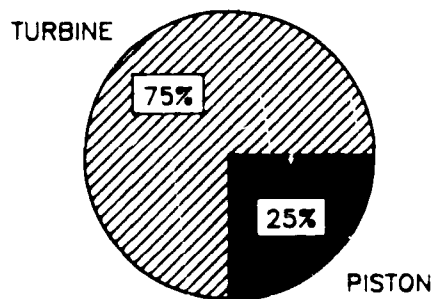
PERCENT BY AIRCRAFT TYPE



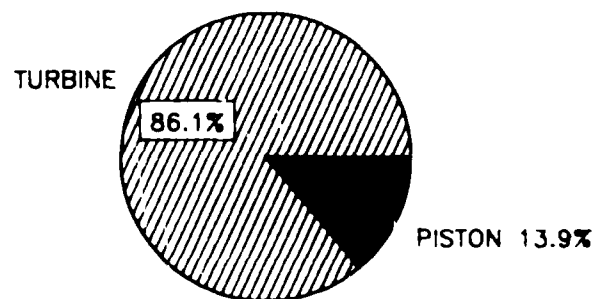
ROTORCRAFT HOURS FLOWN



PERCENT BY AIRCRAFT TYPE



1986



1998

Chapter VII

FAA Workload Measures

The FAA provides the aviation community with three distinct operational services: air traffic control at selected airports, traffic surveillance and aircraft separation by Air Route Traffic Control Centers, and flight planning and pilot briefings at Flight Service Stations. All four aviation system user groups--commercial air carriers, commuter/air taxis, general aviation, and military--utilize these operational services to enhance aviation traffic safety.

Multiple indicators are used to describe the total FAA operational workload. The four aviation system user groups differ in the demands they impose on the air traffic system. Consequently, no single measure typifies past trends or future demand for the services provided by the FAA. There have been, and will continue to be, different socioeconomic forces driving the growth of each of the aviation-user categories.

REVIEW OF 1986

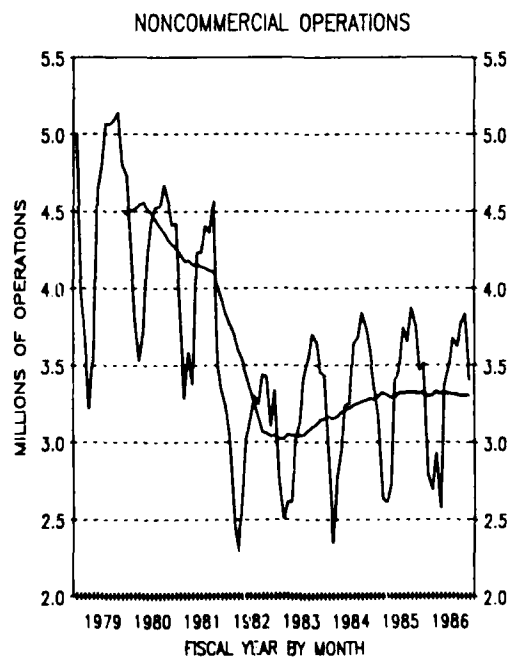
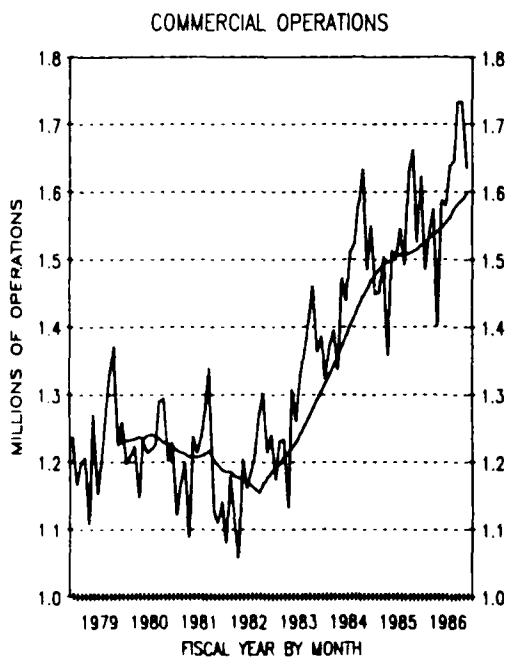
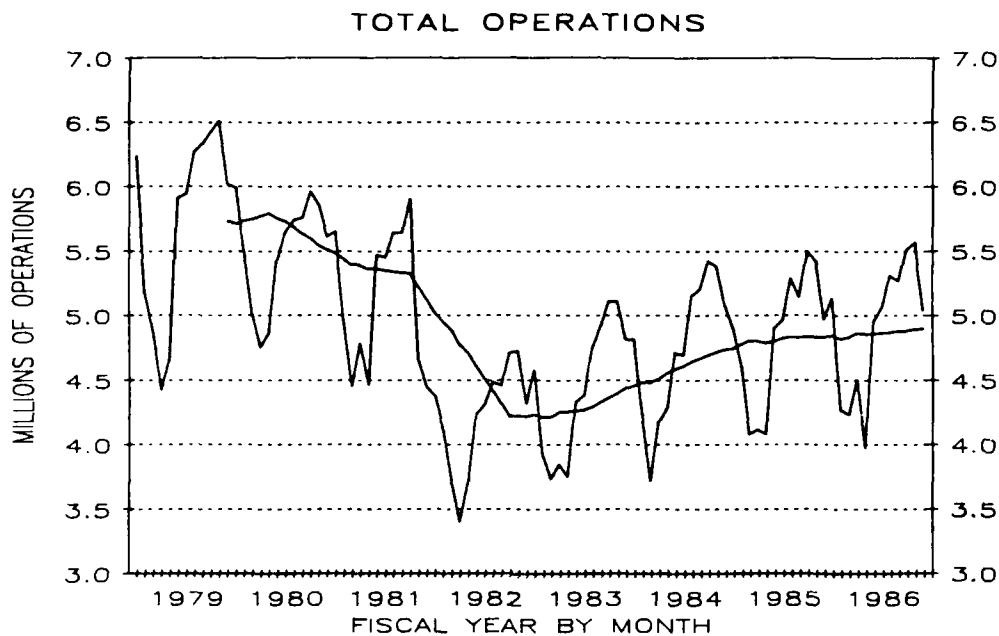
FAA Tower Activity

Aircraft activity at the 399 FAA towered airports increased by 1.7 percent in fiscal 1986, the fourth uninterrupted year of growth. During this 4-year time period, operations at FAA towers have increased by 16.3 percent, growing from 50.635 million operations in 1982 to 58.906 million operations in 1986. Despite this growth, tower operations still remain 7.9 percent below the level of activity achieved in the 12-month period immediately preceeding the August 1981 air traffic controllers' strike (hereafter referred to as the pre-strike period).

The vast majority of the growth that has occurred since 1982 has been the result of the strong demand for commercial aviation services. Commercial activity, the sum of air carrier and commuter/air taxi operations, has increased by 35.8 percent since 1982, 5.5 percent in 1986. Noncommercial operations, the sum of general aviation and military operations, has increased by only 8.8 percent since 1982. Noncommercial activity actually declined slightly in 1986.

TOWERED AIRPORT OPERATIONS

ACTUAL AND 12 MONTH MOVING AVERAGE



Air carrier operations at FAA towered airports totaled 12.290 million in fiscal 1986, an increase of 8.9 percent over 1985 and 35.8 percent above the 9.049 million operations attained in fiscal 1982, the first year following the air controllers' strike. The large growth in 1986 was due, in part, to the fact that Pan American and United Airlines were on strike for a combined total of 55 days in fiscal 1985. However, increased hubbing activity at major air carrier airports appears to be the major cause for the large increase in activity at FAA towered airports in 1986.

Commuter/air taxi operations, the fastest growing user group over the past several years, declined slightly to 6.909 million operations in fiscal 1986. The decline in 1986 broke a string of 13 consecutive years of growth. Until 1986, commuter/air taxi tower operations had shown an increase in every year since the user category was first designated in fiscal 1972. One reason for the decline is that there are 10 to 15 fewer regionals/commuters in 1986. Another possible explanation is that the increase in regionals/commuters code-sharing and schedule tie-ins with larger commercial air carriers may have actually resulted in a one-time decline in operations. There appears to have been a concerted shift from the smaller commuter aircraft (under 19 seats) to the larger and faster commuter aircraft which are thought to be more comparable to the aircraft operated by the larger air carriers. Although the number of seats offered in these markets may have increased, there has been a slight decline in the number of operations.

General aviation activity has, for the most part, failed to respond to the general upturn in the U.S. economy which began in 1983. The 37.070 million operations recorded in fiscal 1986, a slight decline from 1985 activity levels, equalled only 79.3 percent of the pre-strike level of operations. General aviation itinerant operations declined by 2.0 percent in 1986 to 21.921 million, while local operations increased 2.2 percent to 15.149 million.

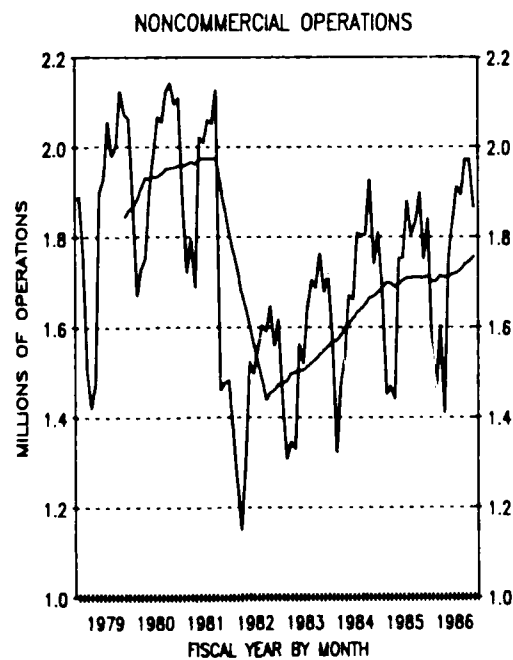
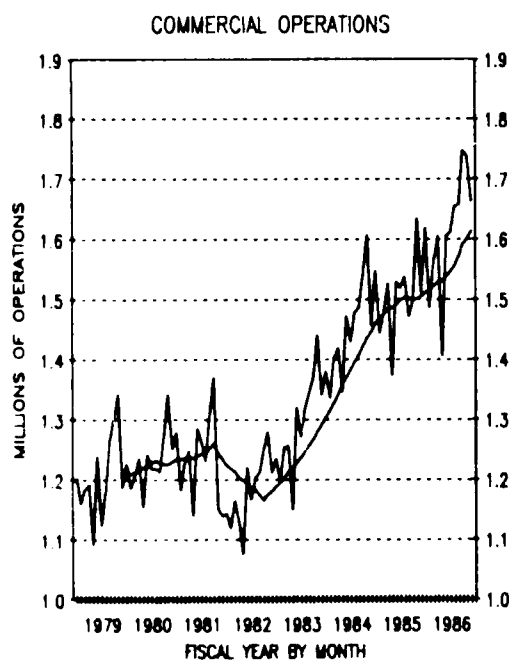
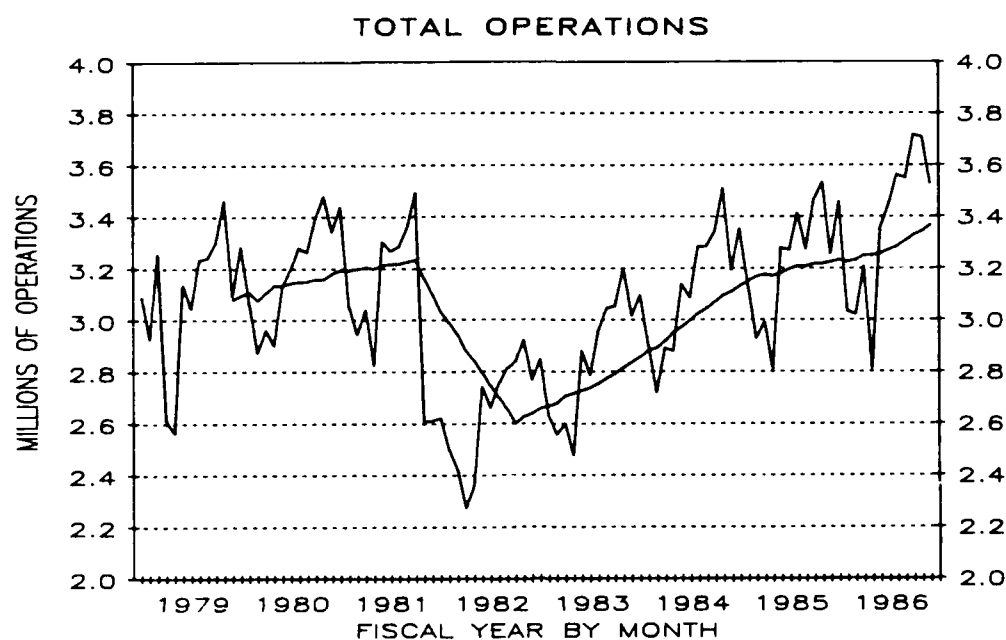
Military operations totaled 2.637 million in fiscal 1986, 3.5 percent above 1985 levels. Itinerant military operations accounted for 1.357 million of the total, and local military operations for the remaining 1.280 million.

Instrument Operations

Instrument operations handled at FAA towers totaled 40.427 million in fiscal 1986, 4.5 percent above the 1985 activity level and 4.1 percent above the level of activity recorded in the pre-strike period. Instrument operations performed by commercial carriers increased by 6.8 percent in 1986, with air carriers leading all user groups with a 8.5 percent increase. Commuter/air taxi instrument operations increased by 3.6 percent, considerably lower than in previous years. General aviation and military instrument operations registered increases of 2.1 percent and 3.9 percent, respectively.

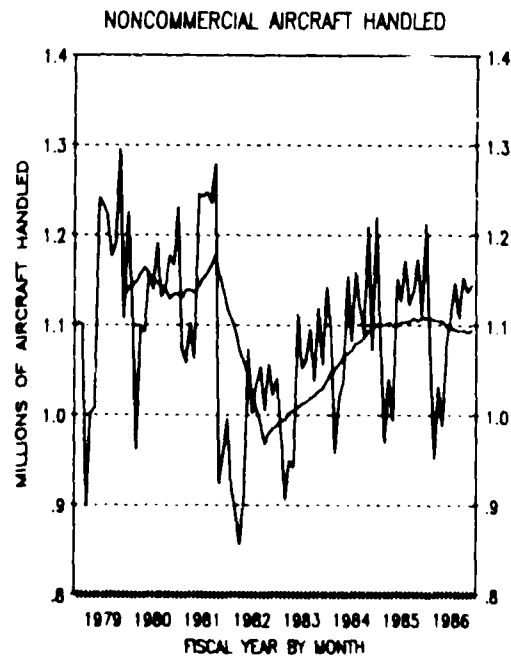
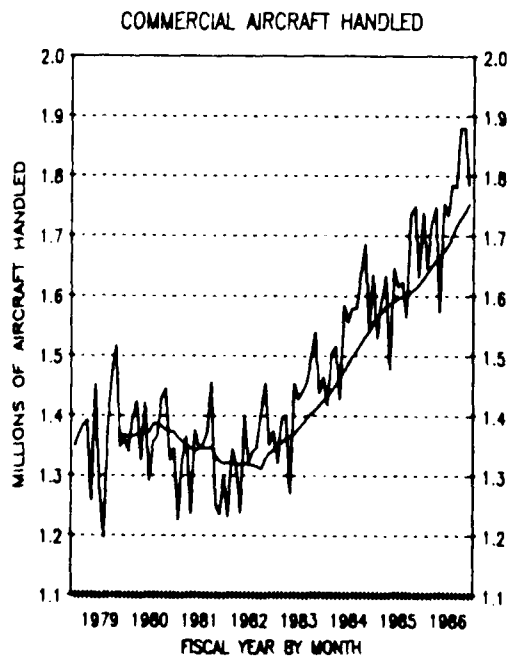
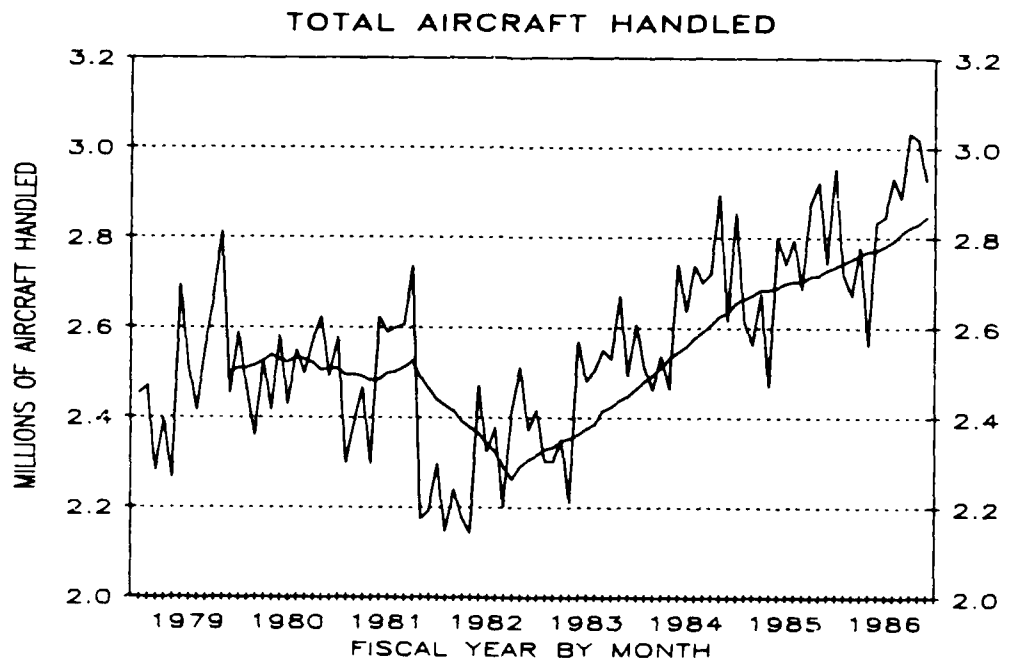
INSTRUMENT OPERATIONS

ACTUAL AND 12 MONTH MOVING AVERAGE



IFR AIRCRAFT HANDLED

ACTUAL AND 12 MONTH MOVING AVERAGE

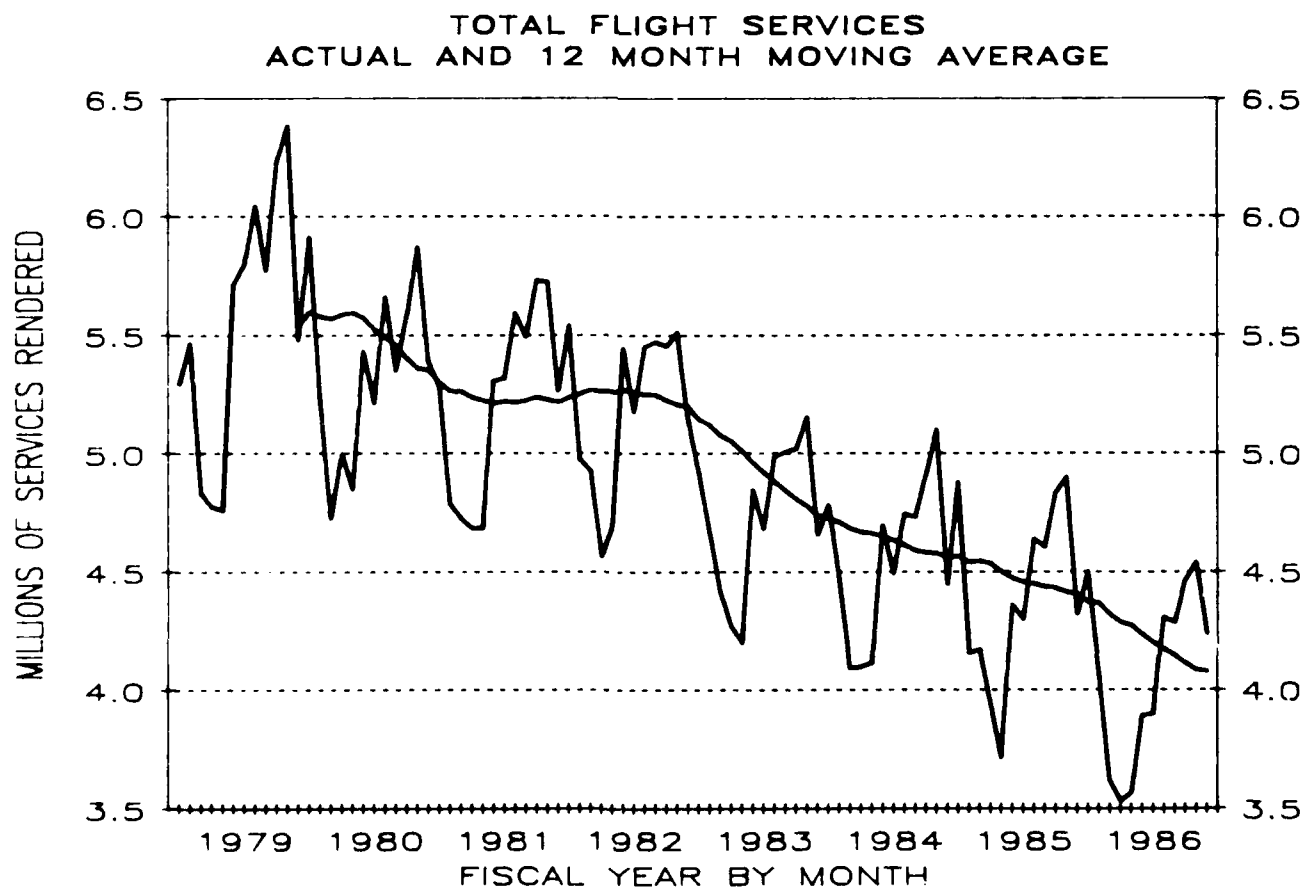


Center Activity

In fiscal 1986, the number of aircraft flying under instrument rules handled by Air Traffic Control Centers' personnel totaled 34.152 million, an increase of 4.4 percent over 1985. Most of the increase at the Centers can also be attributed to the growth in commercial aviation activity. Commercial aircraft handled at the Centers increased by 8.2 percent compared to a decline of 1.1 percent in the number of noncommercial aircraft handled. The number of air carrier aircraft handled increased by 9.5 percent, and the number of commuter/air taxi aircraft handled increased by 4.5 percent. Military aircraft handled increased by 2.7 percent in fiscal 1986, while the number of general aviation aircraft handled declined by 3.5 percent.

Flight Service Station Activity

User demand on Flight Service Stations--pilot briefings, flight plans, and aircraft contacted--totaled 48.975 million in fiscal 1986. This marked the seventh consecutive year of declining activity, down 7.4 percent from 1985 and 26.2 percent below the peak 66.390 million services rendered in 1979. User demands for all flight service categories declined in 1986: the number of pilot briefings declined 8.3 percent; the number of aircraft contacted declined 7.2 percent; and, the number of flight plans originated declined 5.8 percent.



FORECAST ASSUMPTIONS

Number of Towers

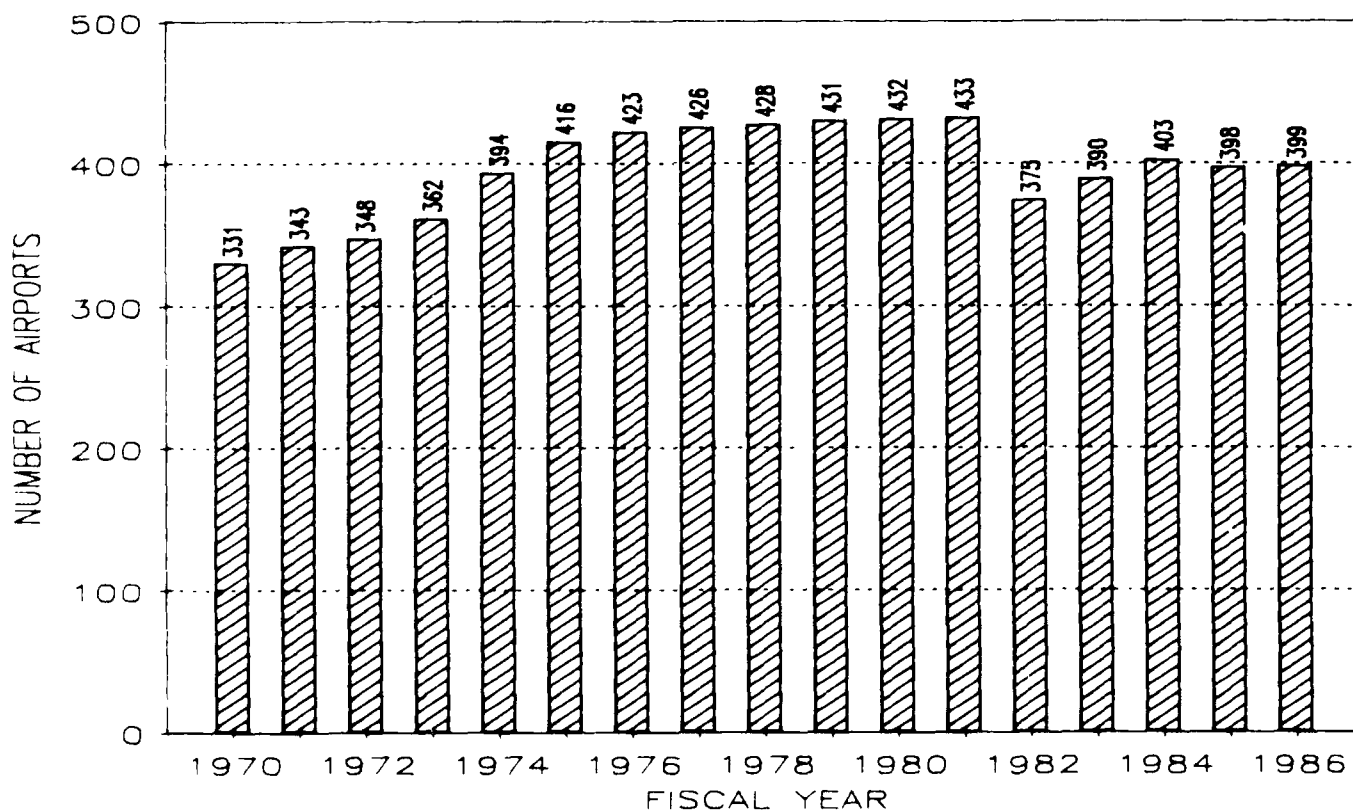
Growth in FAA workload measures includes not only the demand imposed on the National Airspace System, but also aviation activity at those locations previously not provided FAA services. Conversely, aviation activity at contract towers has to be excluded from the workload measures.

The FAA is currently contracting out "Low Activity Towers," and the operation counts at these locations are no longer included in the FAA tower workload measures. There were 15 contract towers in operation in fiscal 1986, two more than were in operation in fiscal 1985. Operations at the contract towers totaled 682,929 in fiscal 1986, an increase of 21.5 percent over the number of operations recorded at contract towers in 1985. General aviation accounted for the vast majority of these operations, totaling 592,918 compared to 54,808 for commuters/air taxis and 30,337 for military. Air carrier operations at contract towers totaled only 4,863 in fiscal 1986.

The current forecast assumes that the number of FAA towered airports will remain constant at the 399 in operation in fiscal 1986.

Operation counts for individual FAA and contract towers, by user group, can be found in the publication FAA Air Traffic Activity FY 1986, compiled by the FAA's Office of Management Systems (AMS-420).

NUMBER OF FAA TOWERED AIRPORTS



WORKLOAD FORECASTS

FAA Tower Activity

Despite four years of relatively strong growth, aircraft activity at FAA towered airports totaled only 92.1 percent of the pre-strike level of activity in fiscal 1986. In addition, 1986 operations were 14.7 percent below the all-time high activity level (69.039 million) recorded in 1979. Activity at FAA towered airports is not expected to return to the pre-strike level (63.966 million) until 1989 and will not exceed the 1979 peak until 1992. Operations at FAA towered airports are forecast to increase by 2.7 percent in 1987 and 3.0 percent in 1988, and to average 2.5 percent over the 12-year forecast period. In absolute numbers, towered operations are forecast to increase from 58.906 million in 1986 to 79.200 million in 1998.

The mix of traffic at FAA towered airports is expected to become somewhat more heterogeneous over the forecast period. This results from the fact that the combined total of general aviation and commuter/air taxi operations is expected to grow at a slightly faster pace than the number of air carrier operations. The combined operations of general aviation and commuters/air taxis are expected to account for almost 76.0 percent of total tower operations in 1998, up from 74.5 percent in fiscal 1986.

The forecasted average annual growth rate for each aviation user group over the 1986 to 1998 period is: commuter/air taxi, 3.9 percent; air carrier, 2.4 percent; and general aviation, 2.4 percent. Military operations are expected to remain constant at the 1986 level of activity.

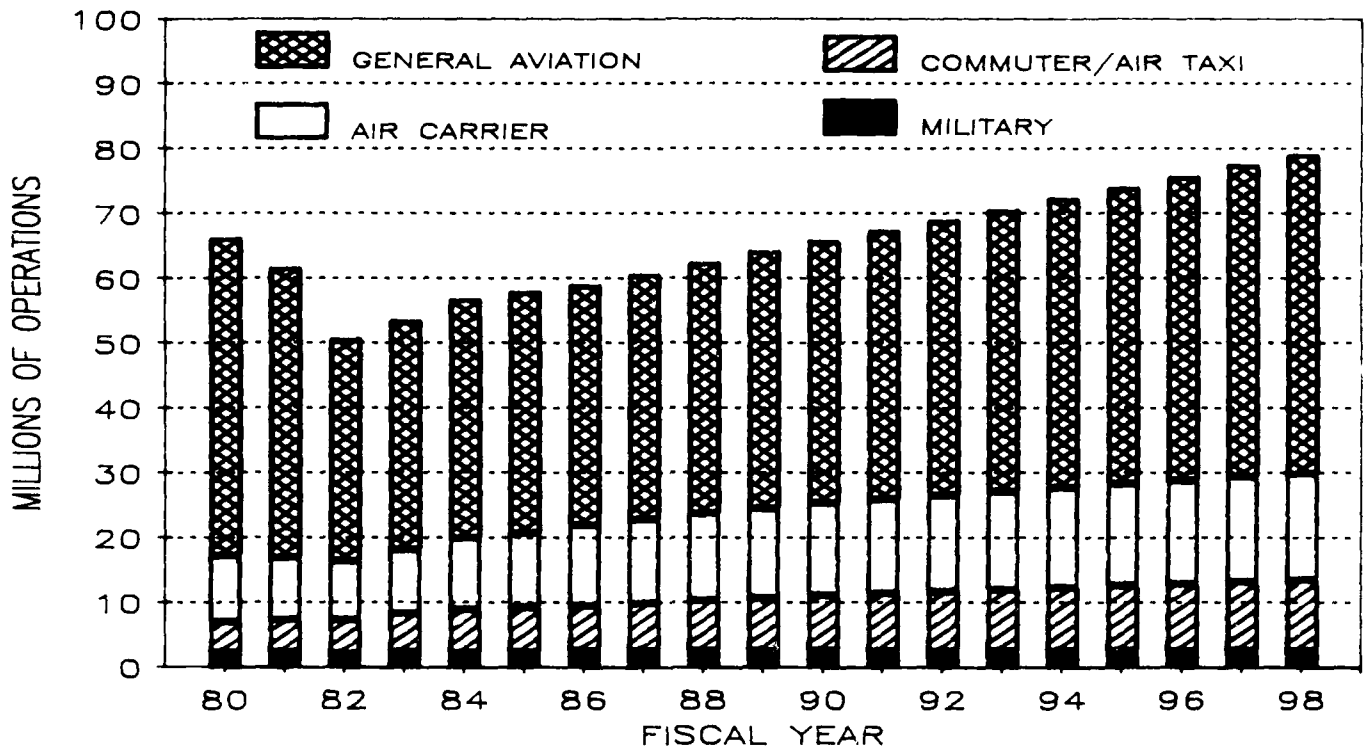
Instrument Operations

Instrument operations at FAA towered airports exceeded the pre-strike level of activity (38.828 million) in fiscal 1986. The number of instrument operations is projected to increase by 3.2 percent in 1987 and 3.1 percent in 1988, and to average 2.4 percent between 1986 and 1998. These growth rates translate into a total of 53.700 million operations in 1998, up from 40.427 million in 1986.

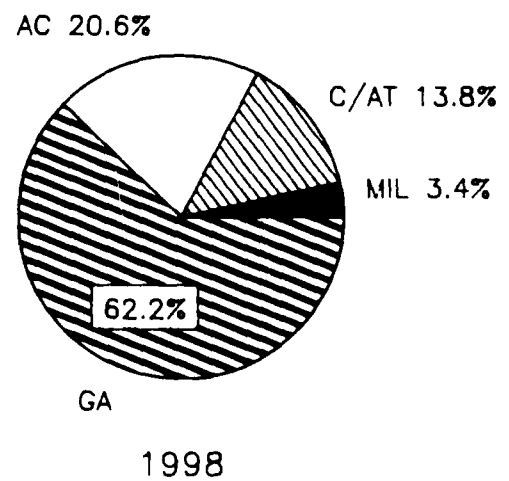
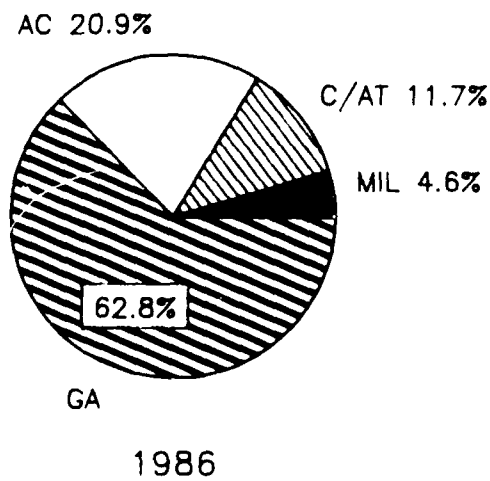
The mix of instrument operations is also expected to become more heterogeneous. The number of commuter/air taxi and general aviation operations performed by smaller aircraft is expected to increase at a somewhat faster rate than the number of operations performed by the larger, more sophisticated air carrier aircraft. By 1998, 61.0 percent of all instrument operations are expected to be performed by commuter/air taxi and general aviation aircraft, up from 58.6 percent in 1986.

The forecasted average annual growth rate for each user group is: commuter/air taxi, 4.0 percent; general aviation, 2.4 percent; and air carrier, 2.3 percent. Military operations are expected to remain constant throughout the forecast period.

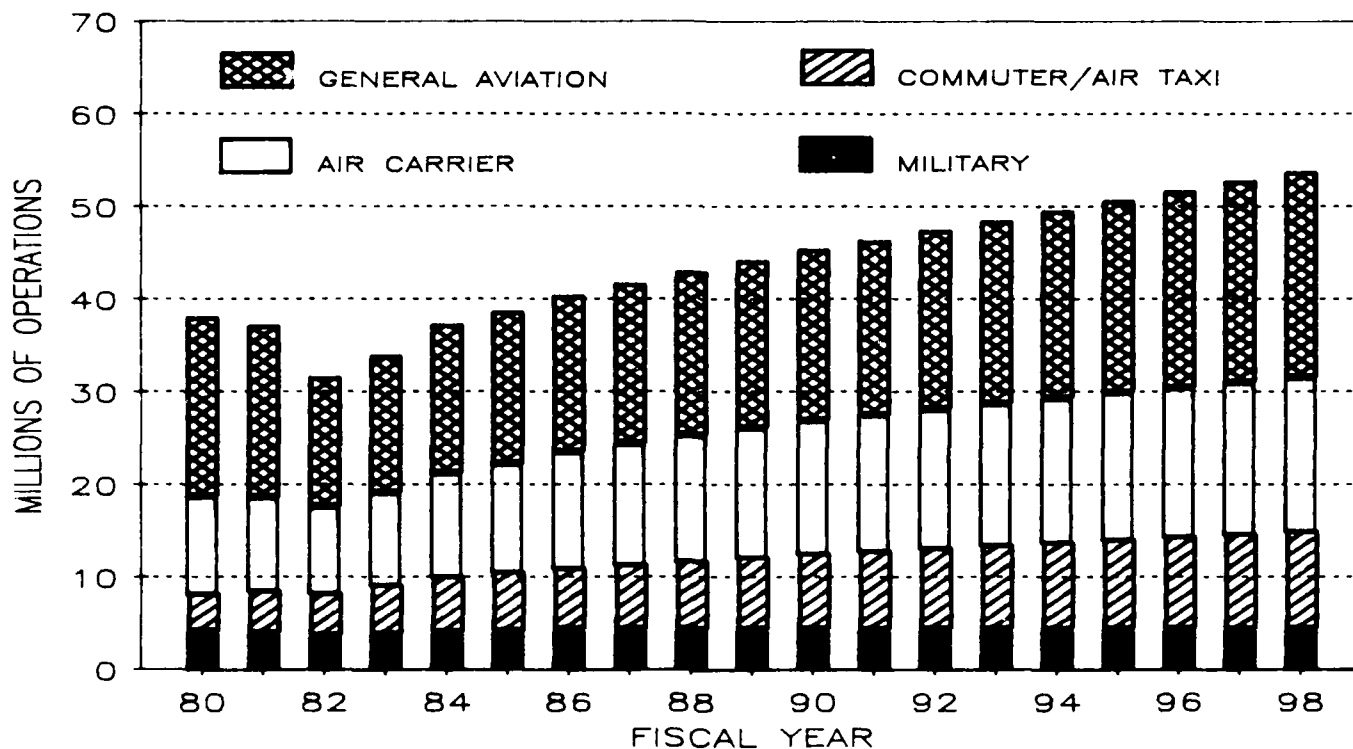
AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE



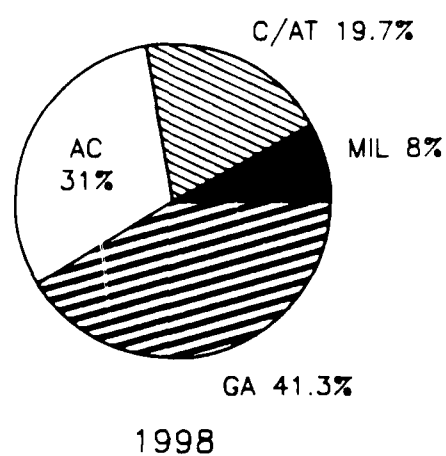
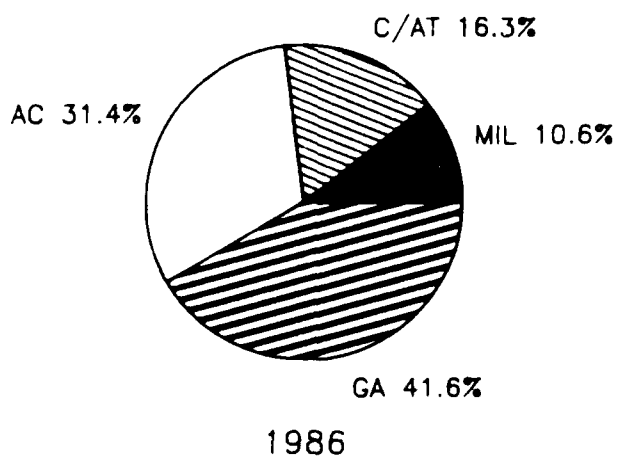
DISTRIBUTION OF WORKLOAD BY USER GROUP



INSTRUMENT OPERATIONS AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE



DISTRIBUTION OF WORKLOAD BY USER GROUP



Center Activity

Following four consecutive years of strong growth, the number of aircraft handled by FAA Centers has exceeded its pre-strike activity level (30.280 million) by 12.8 percent. The workload at FAA Air Route Traffic Control Centers is expected to continue to exhibit strong growth throughout the forecast period, increasing by 3.8 percent in 1987 and 3.4 percent in 1988, and averaging 2.5 percent over the 12-year forecast period. In absolute numbers, the Center workload is forecast to increase from 34.152 million aircraft handled in 1986 to 45.400 million in 1998.

Both air carrier and general aviation's shares of Center workload are expected to decline over the forecast period. Air carrier's share is forecast to decline slightly from 46.9 percent in 1986 to 45.8 percent in 1998. General aviation's share is expected to decline from 23.6 percent to 23.0 percent over the same time period. Commuter/air taxi activity is expected to account for 20.0 percent of Center workload in 1998, up from 14.7 percent in 1986.

The projected average annual growth rate by user group is: commuter/air taxi, 5.1 percent; general aviation, 2.3 percent; and air carrier, 2.3 percent. The number of military operations is expected to remain constant at the 1986 level of activity.

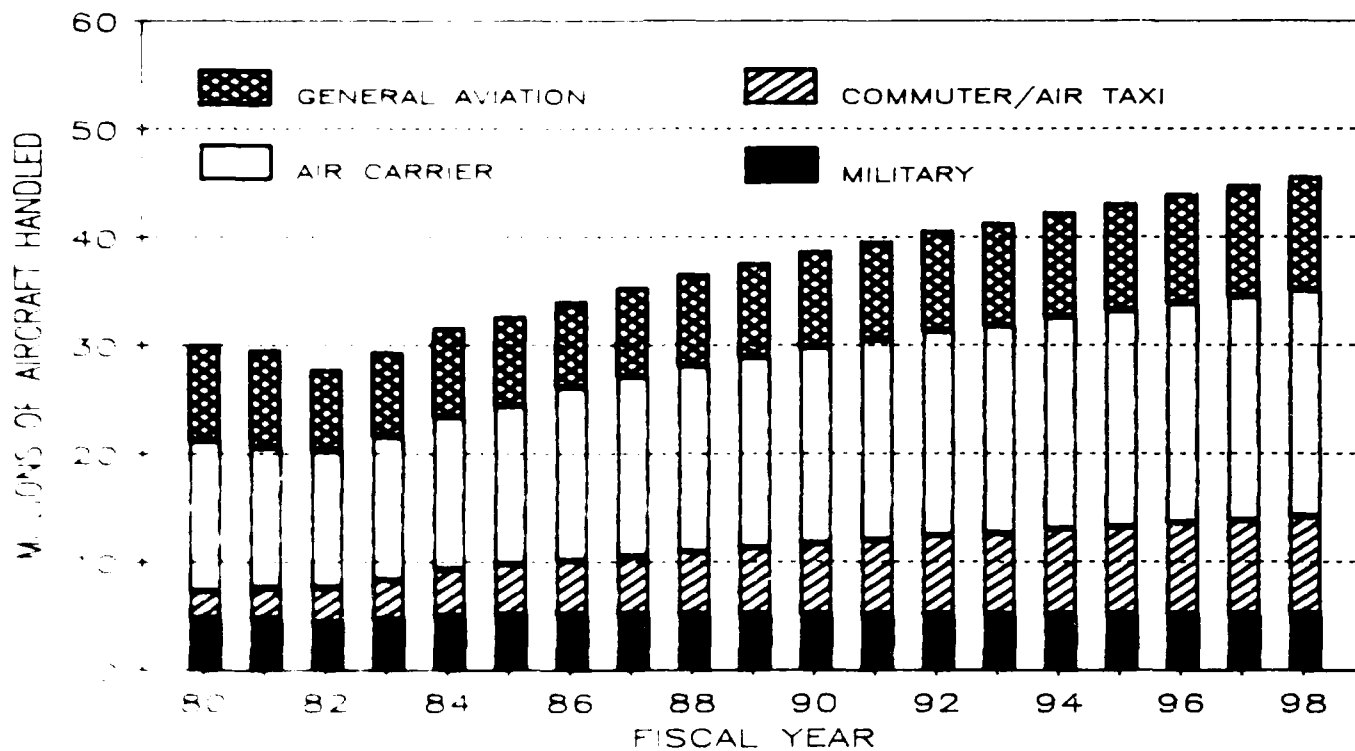
Forecasts for individual Centers are available upon request from the Forecast Branch, Office of Aviation Policy and Plans (APO-110).

Flight Service Station Activity

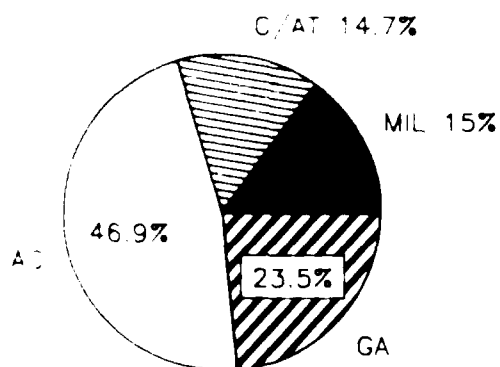
In fiscal 1986, the number of services rendered at FAA Flight Service Stations equaled only 77.8 percent of the level of activity achieved in the pre-strike period. Most important, however, is the fact that the level of activity is not expected to return to the pre-strike activity level (62.916 million) during the entire forecast period. Total flight services originating at Flight Service Stations are projected to decline by 2.5 percent in 1987 and 0.4 percent in 1998, and to average only 1.0 percent annual growth over the entire forecast period. In actual numbers, flight services rendered are forecast to increase from 48.975 million in 1986 to 55.100 million in 1998.

The number of pilot briefings is expected to increase from 13.377 million in 1986 to 14.400 million in 1998, an average annual growth rate of only 0.6 percent. The number of flight plans originated is forecast to increase at an average annual rate of 1.9 percent between 1986 and 1998, from 7.518 million to 9.400 million. The number of aircraft contacted is projected to increase at an annual rate of only 0.3 percent over the forecast period, from 7.184 million in 1986 to 7.500 million in 1998.

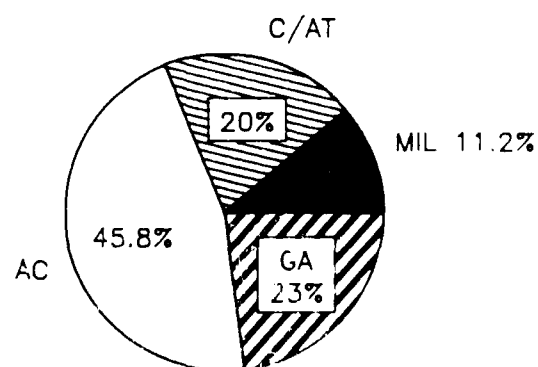
IFR AIRCRAFT HANDLED AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS



DISTRIBUTION OF WORKLOAD BY USER GROUP



1986



1998

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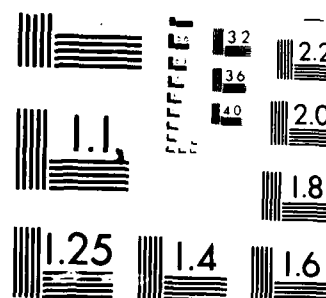
FAA AVIATION FORECASTS - FISCAL YEARS 1987-1998(U)
FEDERAL AVIATION ADMINISTRATION WASHINGTON DC OFFICE OF
AVIATION POLICY AND PLANS FEB 87 FAA-AP0-87-1

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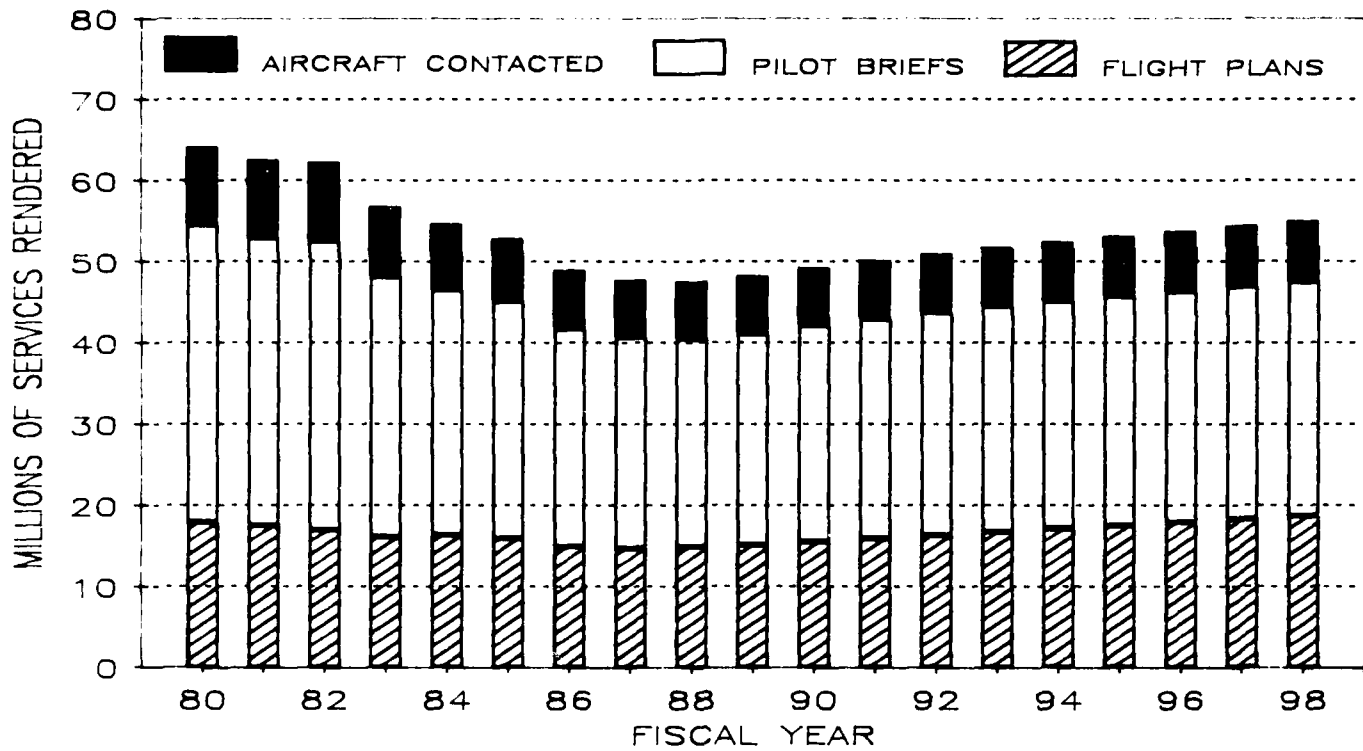
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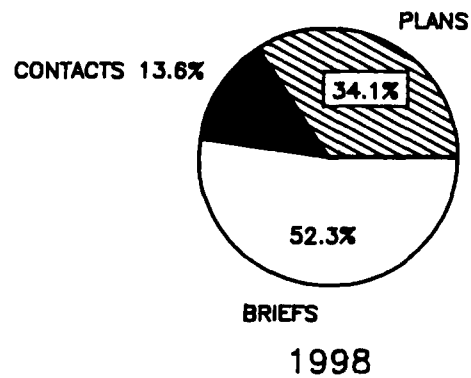
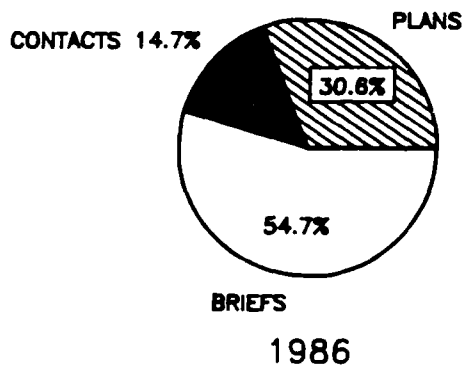


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS - 1963-A

FLIGHT SERVICES ORIGINATED AT FAA FLIGHT SERVICE STATIONS



DISTRIBUTION BY TYPE OF SERVICE RENDERED



It should be noted that user demand, as measured by total flight services, is not indicative of the total workload of the flight service station system. For example, a substantial amount of time is devoted to the preparation of recorded weather briefing data and the processing and dissemination of Notices to Airmen (NOTAM's), Pilot Reports (PIREP's), and Significant Meteorological Events (SIGMET's). However, these activities are not directly related to the level of user demand, and the resources required to perform these functions are not included in the flight service station workload measure.

Forecasts for individual Flight Service Stations are available upon request from the Forecast Branch, Office of Aviation and Policy and Plans (APO-110).

Chapter VIII

Terminal Area Forecasts - Large Hubs

The Terminal Area Forecasts (TAF) is a set of forecasts of enplanements, aircraft operations, instrument operations, and instrument approaches prepared for approximately 4,000 airports in the United States. The data base for the TAF includes airports with FAA towers, airports with commercial service, airports that are in the National Plan of Integrated Airport Systems, and other nontowered public use airports. This chapter presents preliminary data from the TAF for: (1) the top 50 airports in the U.S. ranked by total enplanements in fiscal 1985; (2) the top 50 airports ranked by total operations in 1985; (3) forecasts of total enplanements and operations at 27 large hub airports; (4) summary data for large, medium, and small hub airports, and (5) selected data by user category for five airports where "hub studies" were conducted for the metropolitan areas in 1985 and 1986. For analytical purposes, airport hub size is consistent with the enplanement percentages indicated in the definition for air traffic hubs, page 155 of the Glossary of Terms.

The preliminary forecasts contained in this chapter are currently undergoing regional review. The final forecasts will be available in FAA Terminal Area Forecasts FY 1986-2000 from the FAA Office of Aviation Policy and Plans.

REVIEW OF 1985

Top 50 Airports

In fiscal 1985, Chicago O'Hare was the busiest airport in the U.S. when ranked both by total enplanements (air carrier, commuter and air taxi) and total aircraft operations. Chicago had 23.0 million passenger enplanements and 768,100 aircraft operations. Atlanta was the second busiest airport with 21.6 million enplanements and 749,900 operations. These rankings were identical to those observed in 1983 and 1984. In terms of total enplanements, Chicago and Atlanta reversed ranks in 1983 and later years relative to 1981 and 1982.

Other airports in the top five ranked by total enplanements in 1985 were Los Angeles International, Dallas/Fort Worth International, and New York Kennedy. These were ranked 3rd, 4th, and 5th in total enplanements and 4th, 3rd, and 24th, respectively, in total operations. Fiscal 1985 marks the second year that Dallas/Fort Worth enplaned more people than Kennedy. Also, in 1985, Santa Ana (an air carrier airport) displaced Van Nuys, California (a general aviation airport) among the top five towered airports in the United States. Previously, Van Nuys had been among the top five busiest airports in the nation in terms of total operations for several years.

TOP 50 AIRPORTS RANKED BY 1985 TOTAL PASSENGER ENPLANEMENTS

<u>AIRPORT</u>	<u>TOTAL ENPLANEMENTS*</u> (000)	<u>PERCENT**</u>	<u>CUMULATIVE PERCENT</u>	<u>FY84 RANK</u>
1. Chicago O'Hare	23,038	5.67	5.67	1
2. Atlanta	21,620	5.33	11.00	2
3. Los Angeles International	19,547	4.81	15.81	3
4. Dallas/Ft. Worth	18,276	4.50	20.31	4
5. New York Kennedy	16,983	4.18	24.49	5
6. Newark	14,408	3.55	28.04	8
7. Denver	14,387	3.54	31.58	6
8. San Francisco International	12,233	3.01	34.59	7
9. Miami	10,897	2.68	37.27	11
10. Boston	10,343	2.55	39.82	10
11. New York LaGuardia	10,238	2.52	42.34	9
12. St. Louis International	9,614	2.37	44.71	12
13. Honolulu	9,109	2.24	46.95	13
14. Minneapolis-St. Paul	7,468	1.84	48.79	16
15. Pittsburgh	7,328	1.80	50.59	15
16. Detroit	7,291	1.80	52.39	19
17. Washington National	7,181	1.77	54.16	14
18. Houston Intercontinental	7,001	1.72	55.88	17
19. Phoenix	6,668	1.64	57.52	18
20. Seattle-Tacoma	6,151	1.51	59.03	20
21. Philadelphia	5,578	1.37	60.40	21
22. Las Vegas	5,193	1.28	61.68	22
23. Charlotte	4,998	1.23	62.91	23
24. Orlando	4,950	1.22	64.13	24
25. Tampa	4,359	1.07	65.20	25
26. Salt Lake City	4,235	1.04	66.24	28
27. San Diego	4,000	0.99	67.23	26
28. Baltimore	3,861	0.95	68.18	30
29. Houston Hobby	3,711	0.91	69.09	27
30. Kansas City	3,508	0.86	69.95	32
31. Ft. Lauderdale	3,272	0.81	70.76	33
32. Dallas Love Field	3,257	0.80	71.56	31
33. Memphis	3,198	0.79	72.35	36
34. Cleveland	3,192	0.79	73.14	34
35. New Orleans	3,181	0.78	73.92	29
36. Portland	2,551	0.63	74.55	37
37. San Juan	2,541	0.63	75.18	35
38. San Antonio	2,295	0.57	75.78	38
39. Washington Dulles	2,189	0.54	76.29	39
40. San Jose	2,180	0.54	76.83	41
41. Cincinnati	2,161	0.53	77.36	43
42. Oakland	2,132	0.53	77.89	45
43. Kahului	2,021	0.50	78.39	40
44. Albuquerque	1,964	0.48	78.87	44
45. West Palm Beach	1,876	0.46	79.33	39
46. Austin	1,819	0.45	79.78	49
47. Indianapolis	1,793	0.44	80.22	51
48. Hartford	1,747	0.43	80.65	48
49. Dayton	1,747	0.43	81.08	54
50. Buffalo	1,745	0.43	81.51	42

Source: FAA Terminal Area Forecasts FY 1986-2000

* Includes U.S. certificated route air carriers, foreign flag carriers, supplementals, air commuters, and air taxis.

** Based on 406.009 million passenger enplanements.

TOP 50 AIRPORTS RANKED BY 1985 TOTAL AIRCRAFT OPERATIONS

<u>AIRPORT</u>	<u>TOTAL OPERATIONS (000)</u>	<u>PERCENT*</u>	<u>CUMULATIVE PERCENT</u>	<u>FY84 RANK</u>
1. Chicago O'Hare	768.1	1.33	1.33	1
2. Atlanta	749.9	1.29	2.62	2
3. Dallas/Ft. Worth	547.9	0.95	3.57	5
4. Los Angeles International	546.0	0.94	4.51	4
5. Santa Ana	521.6	0.90	5.41	7
6. Van Nuys	503.5	0.87	6.28	3
7. Denver Stapleton	502.9	0.87	7.15	6
8. St. Louis International	411.3	0.71	7.86	10
9. Boston	402.7	0.70	8.56	12
10. Newark	400.2	0.69	9.25	20
11. Long Beach	398.6	0.69	9.94	8
12. San Francisco International	396.2	0.68	10.62	9
13. Phoenix Sky Harbor	394.3	0.68	11.30	11
14. Seattle Boeing Field	383.5	0.66	11.96	13
15. Oakland	370.6	0.64	12.60	14
16. New York LaGuardia	367.3	0.63	13.23	17
17. Detroit Metro	366.3	0.63	13.86	30
18. San Jose	364.8	0.63	14.49	18
19. Minneapolis/St. Paul	362.0	0.63	15.12	26
20. Pittsburgh	360.9	0.62	15.74	22
21. Honolulu	353.9	0.61	16.35	23
22. Philadelphia	350.7	0.61	16.96	25
23. Denver Arapahoe	340.8	0.59	17.55	16
24. New York Kennedy	338.6	0.58	18.13	19
25. Anchorage Merrill Field	334.4	0.58	18.71	15
26. Memphis	332.1	0.57	19.28	34
27. Washington National	330.6	0.57	19.85	24
28. Charlotte	329.5	0.57	20.42	32
29. Miami International	329.5	0.57	20.99	21
30. Houston Intercontinental	316.3	0.55	21.54	28
31. Houston Hobby	312.2	0.54	22.08	27
32. Pontiac	306.4	0.53	22.61	33
33. Las Vegas	301.8	0.52	23.13	35
34. Dallas Love Field	301.2	0.52	23.65	29
35. Miami Tamiami	300.7	0.52	24.17	31
36. Baltimore	283.7	0.49	24.66	37
37. New Orleans Lakefront	280.6	0.48	25.14	60
38. Teterboro	271.6	0.47	25.61	38
39. Tampa	267.6	0.46	26.07	36
40. Torrance	259.9	0.45	26.52	39
41. Fort Worth Meacham	259.1	0.45	26.97	40
42. San Diego Montgomery	252.7	0.44	27.41	42
43. Salt Lake City	252.3	0.44	27.85	43
44. Caldwell	251.7	0.43	28.28	44
45. Burbank	245.3	0.42	28.70	49
46. Chicago Palwaukee	244.5	0.42	29.12	79
47. Bedford	244.4	0.42	29.54	56
48. Hayward	243.2	0.42	29.96	41
49. Phoenix Deer Valley	242.6	0.42	30.38	52
50. Concord	241.0	0.42	30.80	51

Source: FAA Terminal Area Forecasts FY 1986-2000

* Based on 57.937 million aircraft operations at 399 FAA-operated airport traffic control towers in FY 1985.

In FY 1985, the top 50 commercial airports accounted for 81.5 percent of the total number of enplanements (air carrier, commuter, and air taxi) which occurred at airports with 1,000 or more enplanements. In fact, the top five airports (Chicago, Atlanta, Los Angeles, Dallas/Fort Worth, and New York Kennedy) accounted for over 24 percent of total passenger enplanements. The top 20 airports had 59 percent of total enplanements. These percentages have remained essentially unchanged from those of 1984.

Large/Medium/Small Hub Airports

In 1985, there were 27 large hub airports, 48 medium hub airports, and 63 small hub airports. The large hub airports accounted for 273.1 million enplanements, 67.3 percent of the approximately 406.0 million air carrier/commuter/air taxi passengers enplaned nationally. The medium hub airports enplaned 88.1 million passengers and the small hub airports enplaned 26.8 million, 21.7 percent and 6.6 percent of the total, respectively. In terms of total passengers, the large hub airports grew by 15.2 percent in 1985. The medium and small hub airports grew by 12.2 percent and 10.0 percent, respectively.

Aircraft operations at the large hub airports totaled 10.3 million in 1986, 3.8 percent above the 1985 level. At the medium and small hub airports, there were 9.7 million and 7.7 million operations, respectively. The 1985 operations at both medium and small hub airports were 1.4 percent above the 1984 level.

LARGE HUB AIRPORT FORECASTS

Using 1985 as the base year, forecasts for airports in the TAF were generated for each year to 2000. The total enplanements and related operations forecasts for the 27 large hub airports for fiscal years 1990 and 2000 are presented on pages 107 and 109. By 2000, Chicago O'Hare is expected to reach nearly 40.7 million enplanements, and Atlanta is expected to reach 33.2 million. It is anticipated that both Dallas/Fort Worth and Denver will have surpassed Atlanta in terms of total enplaned passengers by the year 2000.

Total aircraft operations will reach 934,000 at Chicago O'Hare and 816,000 at Atlanta. These increases will come from growth in the U.S. economy as a whole, and from local airport and airline developments. These developments may include the addition of new gates and the restructuring of airline fleets. Chicago and Atlanta are expected to remain the two busiest airports in the country in terms of the total number of aircraft operations.

Some airports (such as Charlotte, Phoenix, and Newark) will have reasonably high enplanement growth resulting from general economic conditions and managerial decisions by air carriers to use these airports as hubs. Other airports (Los Angeles, New York Kennedy, and Washington National, for example) are expected to experience relatively slow growth because of capacity and environmental or policy constraints.

TOTAL PASSENGER ENPLANEMENTS

AT LARGE HUB AIRPORTS*

(In Thousands)

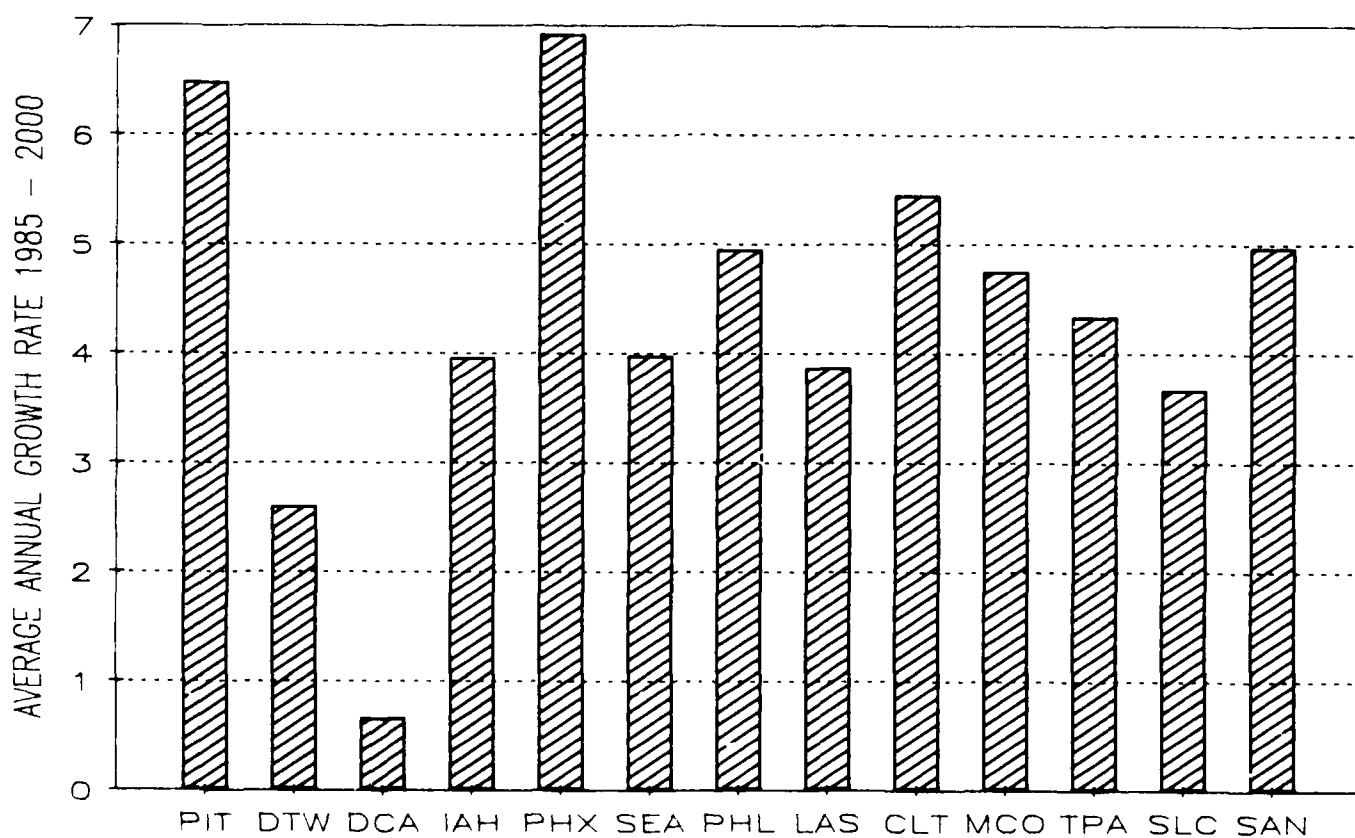
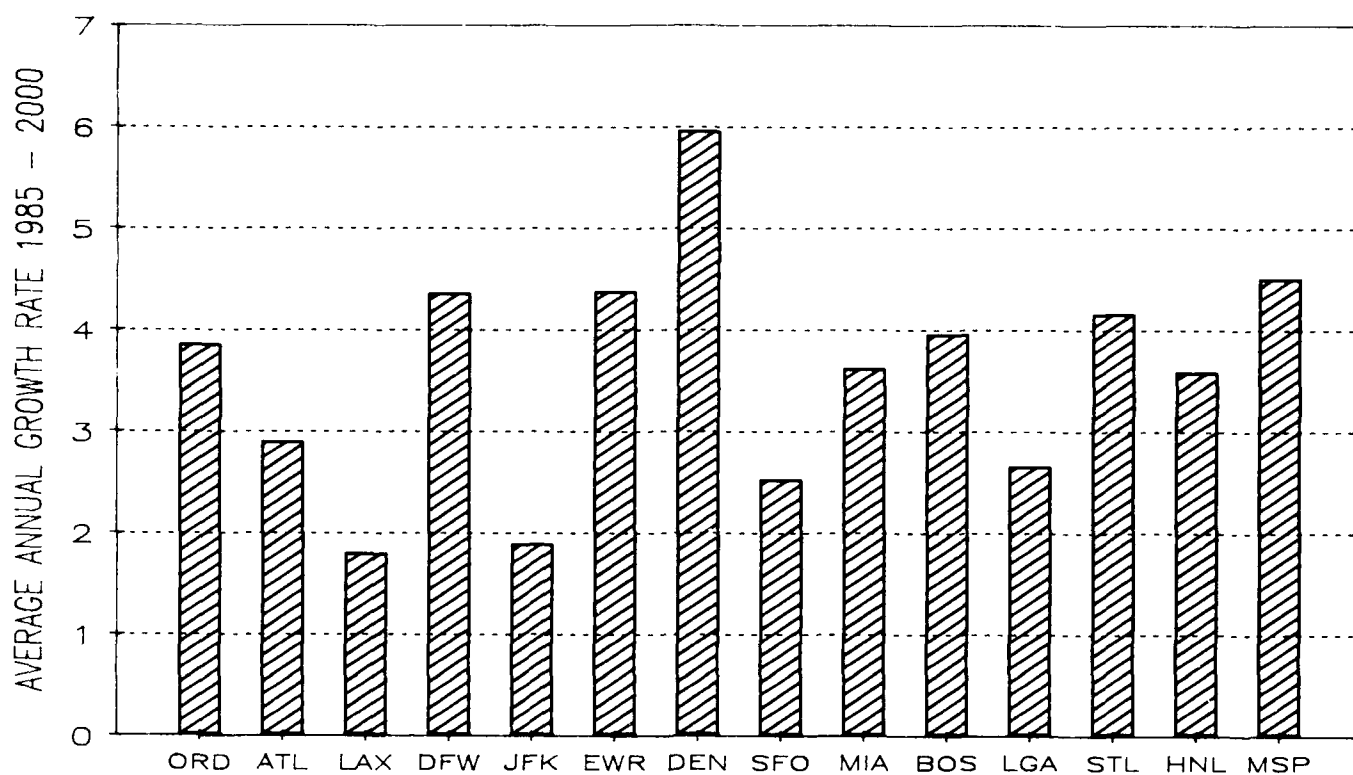
<u>Airport</u>	<u>FY 1985</u>	<u>FY 1990</u>	<u>FY 2000</u>
Chicago O'Hare	23,038	30,458	40,655
Atlanta	21,620	26,402	33,212
Los Angeles**	19,547	21,678	25,541
Dallas/Ft. Worth	18,276	23,474	34,675
New York Kennedy	16,983	18,438	22,500
Newark	14,408	18,811	27,417
Denver	14,387	21,313	34,281
San Francisco**	12,233	14,965	17,799
Miami	10,897	13,500	18,581
Boston	10,343	12,702	18,528
New York LaGuardia	10,238	12,580	15,174
St. Louis	9,614	12,236	17,715
Honolulu	9,109	11,800	15,460
Minneapolis/St. Paul	7,468	10,244	14,476
Pittsburgh	7,328	9,797	18,806
Detroit	7,291	9,448	10,717
Washington National	7,181	7,511	7,924
Houston Intercontinental	7,001	8,400	12,535
Phoenix**	6,668	10,114	18,180
Seattle-Tacoma	6,151	8,450	11,050
Philadelphia	5,578	7,125	11,507
Las Vegas	5,193	6,840	9,185
Charlotte	4,998	7,246	11,083
Orlando	4,950	6,980	9,931
Tampa**	4,359	5,624	8,250
Salt Lake City	4,235	5,588	7,275
San Diego **	4,000	5,245	8,276

* Includes U.S. certificated route air carriers, foreign flag carriers, supplementals, air commuters and air taxis.

** Forecasts as shown in individual hub forecast reports (or as adjusted)

Source: FAA Terminal Area Forecasts FY 1986-2000

PASSENGER ENPLANEMENTS AT LARGE HUB AIRPORTS



TOTAL AIRCRAFT OPERATIONS AT LARGE HUB AIRPORTS*

(In Thousands)

<u>Airport</u>	<u>FY 1985</u>	<u>FY 1990</u>	<u>FY 2000</u>
Chicago O'Hare	768	833	934
Atlanta	750	794	816
Los Angeles**	546	610	634
Dallas/Ft. Worth	548	624	672
New York Kennedy	339	349	379
Newark	400	421	454
Denver	503	565	692
San Francisco**	396	439	461
Miami	329	384	494
Boston	403	456	549
New York LaGuardia	367	370	370
St. Louis	411	492	645
Honolulu	354	397	505
Minneapolis/St. Paul	362	426	476
Pittsburgh	361	400	478
Detroit	366	468	524
Washington National	331	360	400
Houston Intercontinental	316	362	521
Phoenix**	394	475	582
Seattle-Tacoma	236	268	325
Philadelphia	351	410	524
Las Vegas	302	378	509
Charlotte	330	431	537
Orlando	197	262	360
Tampa**	268	318	403
Salt Lake City	252	325	480
San Diego**	161	185	219

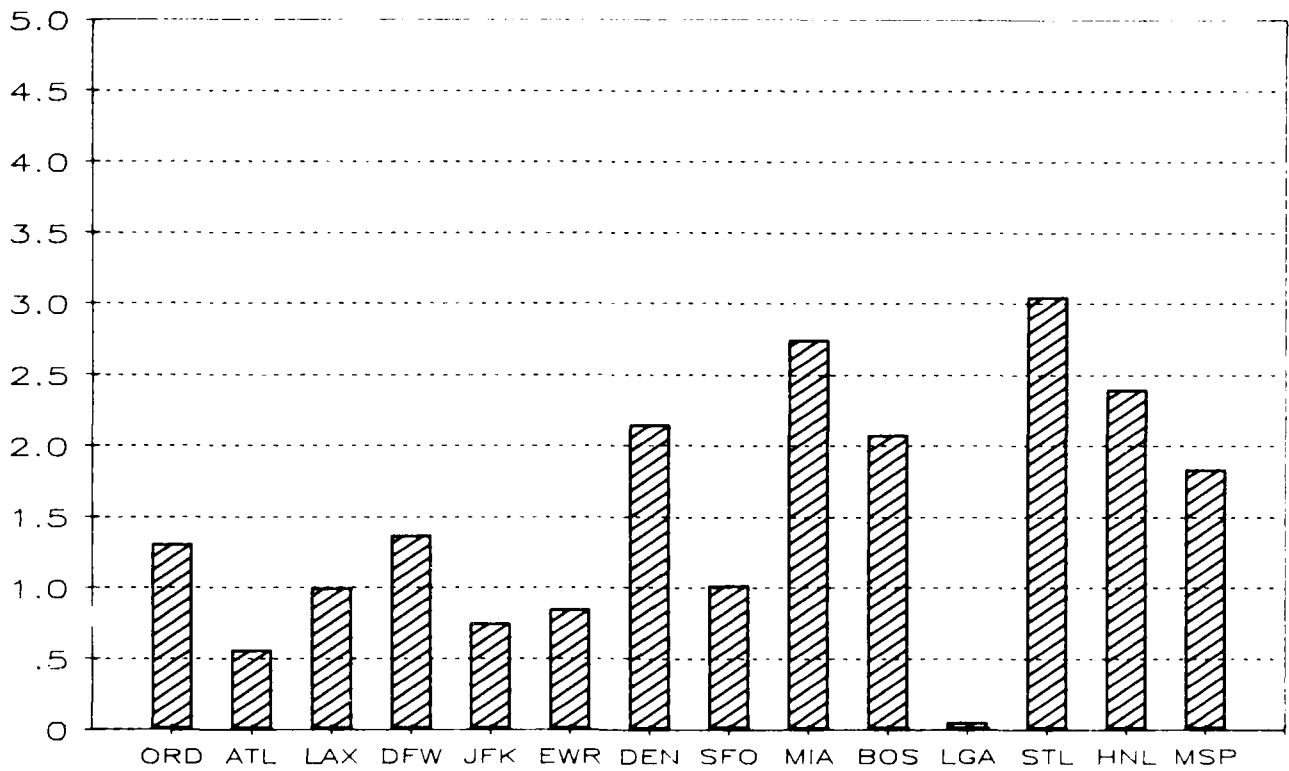
* Includes total itinerant and local operations performed by commercial air carriers, air taxis, military, and general aviation.

** Forecasts as shown in individual hub forecast reports (or as adjusted).

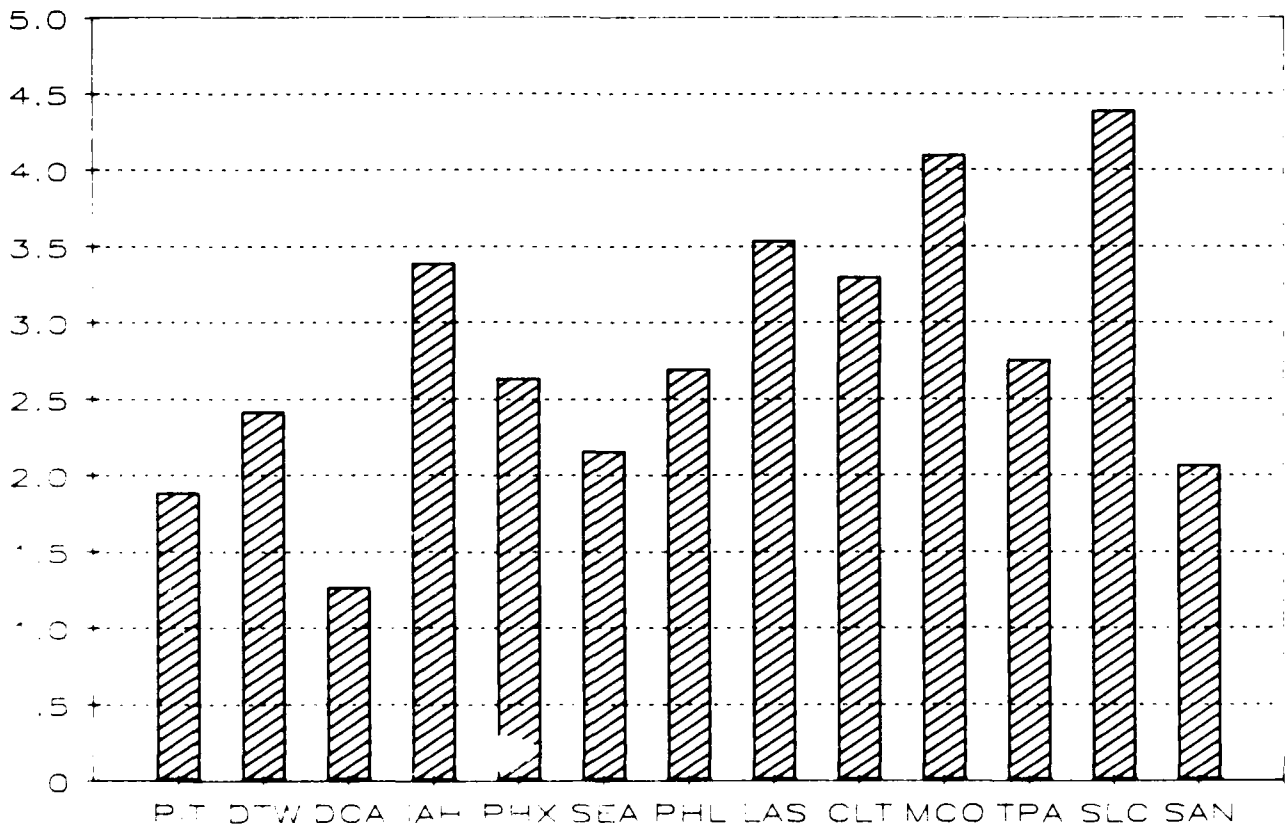
Source: FAA Terminal Area Forecasts FY 1986-2000

TOTAL AIRCRAFT OPERATIONS AT LARGE HUB AIRPORTS

AVERAGE ANNUAL GROWTH RATE 1985 - 2000



AVERAGE ANNUAL GROWTH RATE 1985 - 2000



The average annual growth rates expected for the large hub airports for enplanements and operations for the 1985 to 2000 period are indicated in graphic form on pages 108 and 110. Because of differences in the growth rates among airports, the relative rankings of these 27 hub airports in 2000 will differ from the rankings observed in 1985. For example, in the year 2000 Dallas/Fort Worth will rank 2nd in total enplanements, and Denver will rank 3rd. These airports were ranked 4th and 7th, respectively, in 1985. Other significant increases in rank are exemplified by Pittsburgh and Phoenix. Pittsburgh is expected to rise from 15th to 8th place and Phoenix from 19th to 11th place. At the other extreme, Washington National Airport is expected to fall from 17th place in 1985 to 26th in 2000 when ranked by total enplanements. Large shifts could occur also at other airports if a major airline decides to use a small or medium hub airport as a primary hub. Nashville and Raleigh-Durham, for example, may experience such shifts following American Airline's decisions to use these airports as hubs. Airline mergers, consolidations, and restructuring of routes may also affect the enplanements and operations forecasts and, consequently, the relative ranks of the major hub airports discussed in this section.

MEDIUM/SMALL HUB AIRPORT FORECASTS

The following summary tables and discussions compare the projected growth of the 45 medium and 63 small hub airports to the sum of the 27 large hub airports discussed in the preceeding paragraphs.

SUMMARY OF PASSENGER ENPLANEMENTS AT HUB AIRPORTS (Millions)

	<u>1985</u>	<u>1990</u>	<u>2000</u>	<u>AVERAGE ANNUAL % CHANGE</u>	
				<u>1985-1990</u>	<u>1990-2000</u>
Large Hubs	273.1	347.0	480.7	4.9	3.3
Medium Hubs	88.1	124.0	193.0	7.1	4.5
Small Hubs	26.8	34.2	53.2	5.0	4.5

The table above shows that passenger enplanements at the medium hub airports are expected to increase somewhat faster than the large hub airports, growing at annual average rates of 7.1 percent between 1985 and 1990 and 4.5 percent between 1990 and 2000. Passenger enplanements at the small hub airports are forecast to increase at about the same pace as the large hub airports between 1985 and 1990, but slightly faster than the large hub airports during the 1990 to 2000 time period. The small hub airports are expected to increase at an annual rate of 5.0 percent between 1985 and 1990 and at an annual rate of 4.5 percent between 1990 and 2000.

SUMMARY OF AIRCRAFT OPERATIONS AT HUB AIRPORTS
(Millions)

	<u>1985</u>	<u>1990</u>	<u>2000</u>	<u>AVERAGE ANNUAL % CHANGE</u>	
				<u>1985-1990</u>	<u>1990-2000</u>
Large Hubs	10.3	11.8	13.9	2.8	1.7
Medium Hubs	9.7	11.6	15.5	3.6	2.9
Small Hubs	7.7	9.3	13.2	3.9	3.5

Aircraft operations at the medium hub airports are also expected to grow somewhat faster than the large hub airports over the 15-year forecast period, increasing at an average annual rate of 3.6 percent between 1985 and 1990 and by 2.9 percent annually between 1990 and 2000. Operations at the small hub airports are forecast to exceed the projected growth of both the large and medium hub airports. Between 1985 and 1990, operations at small hub airports are forecast to grow at an annual rate of 3.9 percent. Over the 1990 to 2000 time period, operations are expected to increase at an annual rate of 3.5 percent, twice the growth rate projected for the large hub airports.

SPECIAL HUB FORECASTS

Continuing the individual hub forecasting efforts begun in 1978, FAA sponsored five studies in 1985--Los Angeles, San Francisco, Phoenix, Tampa, and San Diego. These studies were conducted in conjunction with FAA regional, state, and local planners, chambers of commerce, universities, and other interested parties. These groups often provide local aviation data, discuss general economic conditions (current, historical and future outlook), sponsor and attend local seminars, and review preliminary reports. This procedure keeps the public informed of aviation activity in the local community, encourages local input and public participation in the planning process, and, consequently, enhances the acceptability of the final product.

The hub forecast studies examine the metropolitan statistical area or standard consolidated statistical area as a whole. The area usually contains a major air carrier airport and several general aviation airports. Major objectives of these studies include: (1) examination of the interplay between the growth of aviation activity at the major airport and other airports in the area; (2) assessment of possible impacts of the growth of aviation activity in the area; and (3) examination of possible plans to accommodate the growth in aviation. Such plans may include reviews of possible distribution or redistribution of commercial and general aviation traffic and the development of reliever or satellite airports.

The graphics shown on the following pages depict the relative size and growth of enplanements and operations, by user category, at the five major airports with commercial service in the large hubs where special hub forecast studies were conducted. Copies of the detailed studies are available from the Forecast Branch, Office of Aviation Policy and Plans.

Los Angeles Hub

The Los Angeles Hub is the second largest Consolidated Metropolitan Statistical Area in the United States. The hub consists of the following counties: Los Angeles, Orange, Riverside, San Bernardino, and Ventura. The hub's 1985 population was 12.7 million. By 2000, the population is expected to reach 14.7 million, which is 16 percent above the 1985 level.

International, domestic, and commuter air service, as well as general aviation, is handled by 49 airports located within the hub. Of the 49 airports, 18 have FAA towers. Los Angeles International Airport, which is served by 62 scheduled air carriers and seven all-cargo carriers, is the hub's primary air carrier airport. Ontario International augments the air passenger service and air freight service provided by Los Angeles International. Fourteen scheduled and four all cargo air carriers service the airport. In addition to these two airports, significant levels of commercial activity occur at Burbank, Long Beach, Oxnard, Palm Springs, and John Wayne Airports.

Total passenger enplanements in the hub are projected to reach nearly 41.8 million by the year 2000. This represents a 70 percent increase over the 24.6 million passengers enplaned in 1985. Commercial aircraft operations are expected to reach approximately 1 million by the year 2000, which is a 39 percent increase over the 1985 level. For the period 1985 through 2000, general aviation itinerant operations at the 49 hub airports are projected to increase at a yearly rate of 2.8 percent, while local operations are forecast to grow at an annual rate of 2.2 percent.

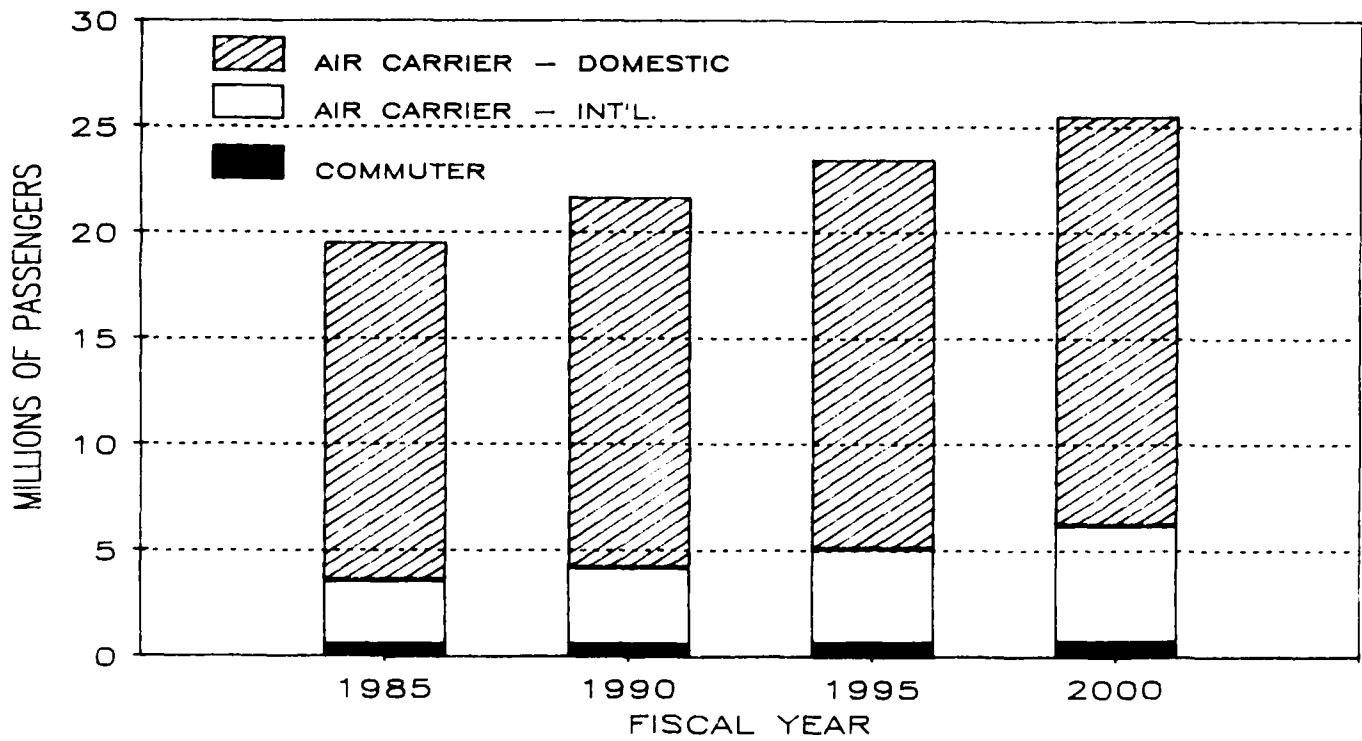
Phoenix Hub

The Phoenix Hub, which is defined as Maricopa County, is the 22nd largest Metropolitan Statistical Area in the United States. The hub's 1985 population was 1.8 million. By 2000, the population is expected to reach 2.9 million, which is 61 percent above the 1985 level.

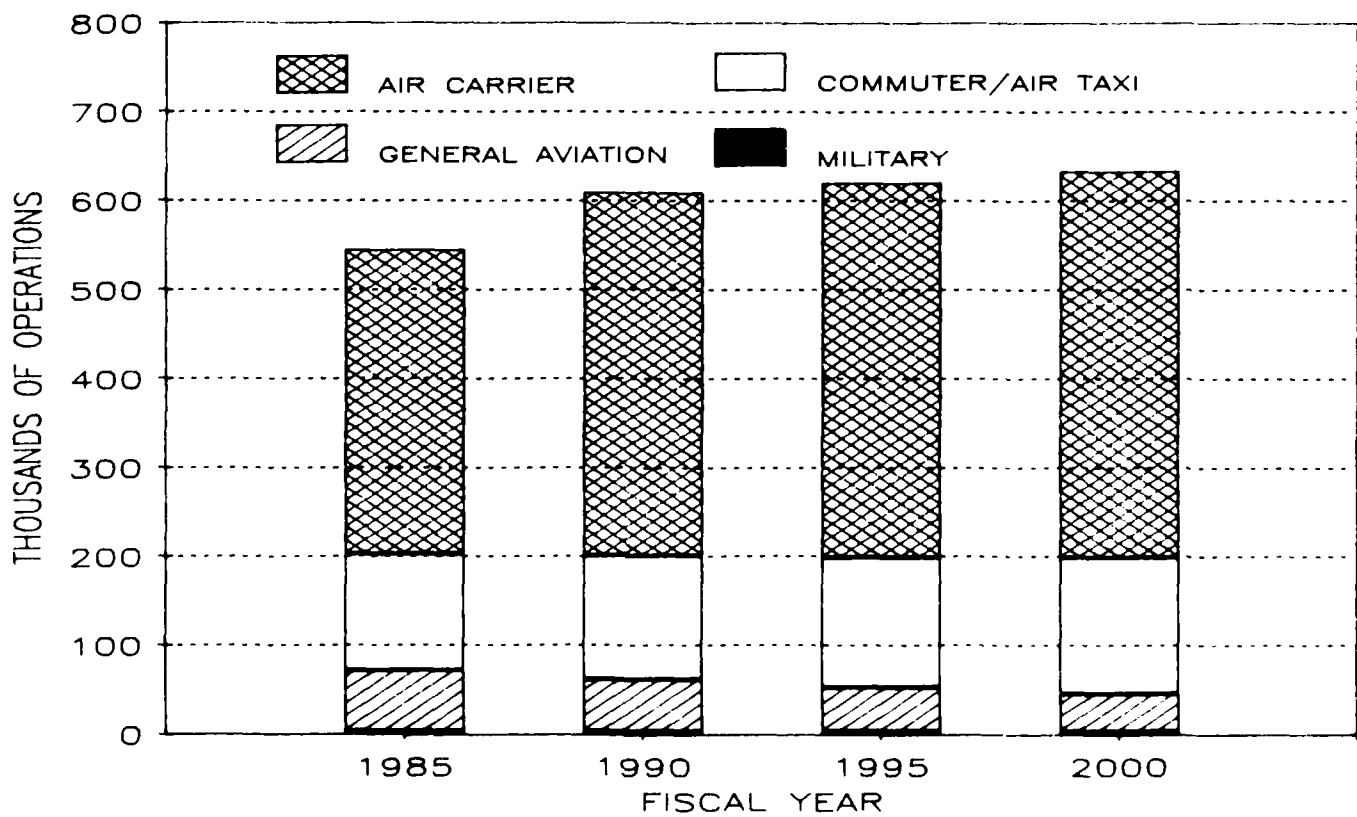
Scheduled certificated and commuter air service in the Phoenix Hub, as well as general aviation, is handled by 15 airports. Phoenix Sky Harbor International Airport, which is served by 16 certificated air carriers and five commuter airlines, is the hub's only air carrier airport. Of the 15 airports, five have FAA towers. A new towered airport, Glendale Municipal, opened in 1986.

LOS ANGELES INTERNATIONAL AIRPORT

PASSENGER ENPLANEMENTS

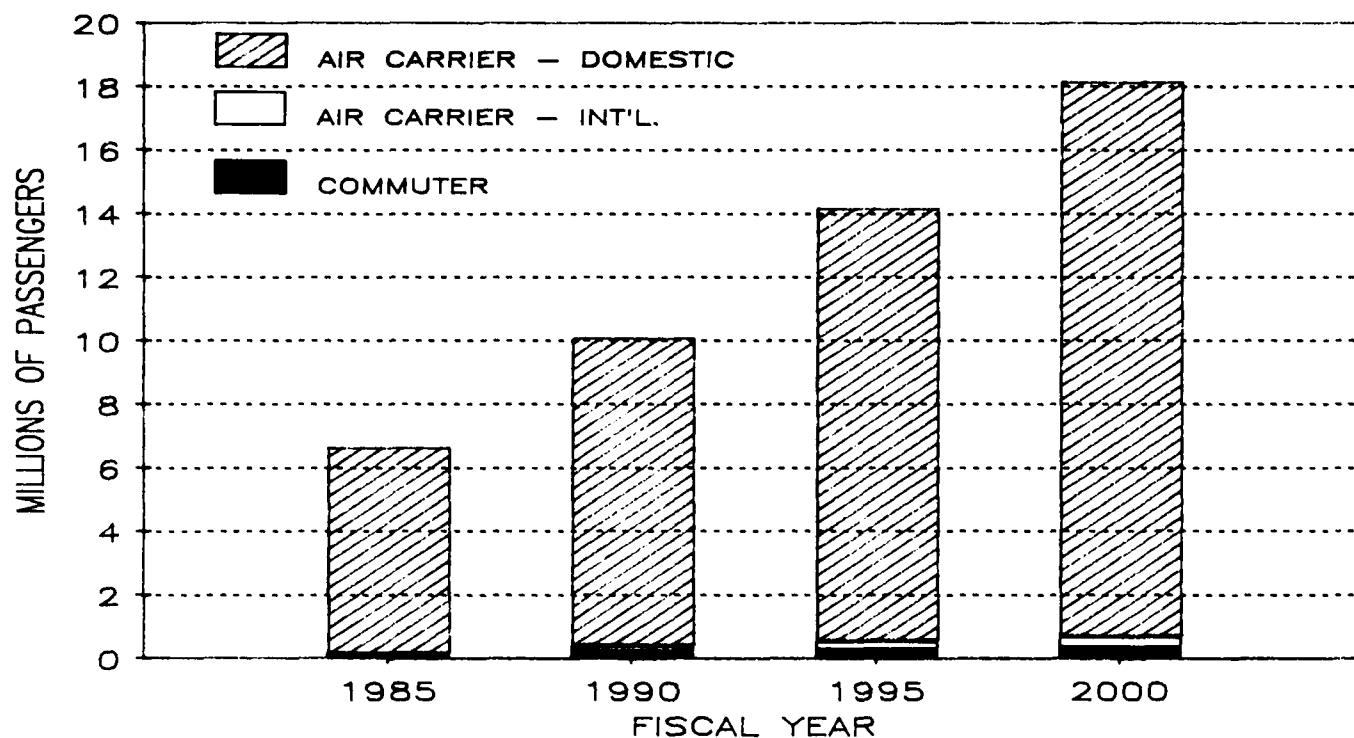


TOTAL AIRCRAFT OPERATIONS

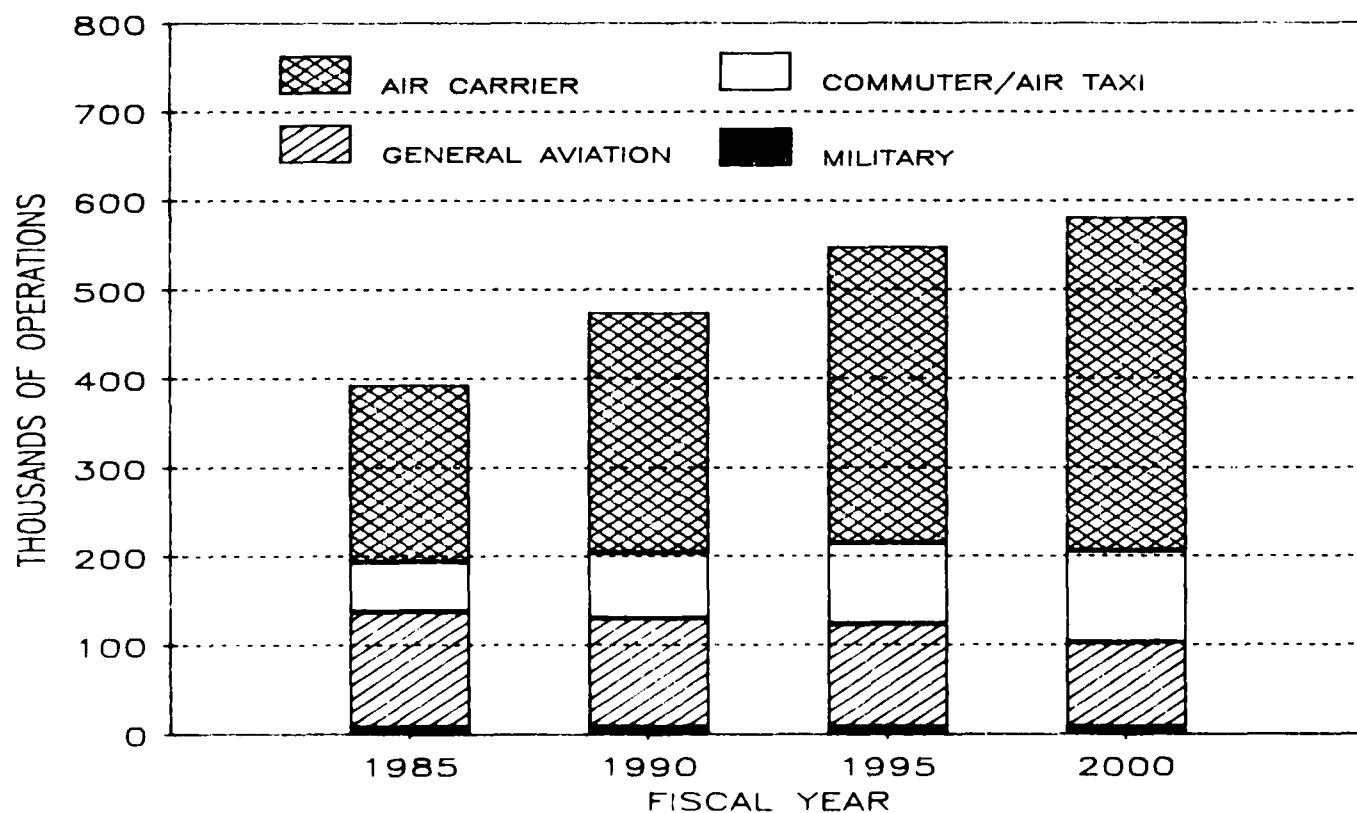


PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

PASSENGER ENPLANEMENTS



TOTAL AIRCRAFT OPERATIONS



Total passenger enplanements in the hub are projected to reach nearly 18.1 million by the year 2000. This represents a 170 percent increase over the 6.7 million passengers enplaned in 1985. Commercial aircraft operations are expected to reach 478,700 by the year 2000, which is 83 percent over the 1985 level. For the period 1985 through 2000, general aviation itinerant operations at the 15 hub airports are projected to increase at a yearly rate of 6.0 percent, while local operations are forecast to grow at an annual rate of 3.7 percent.

San Diego Hub

The San Diego Hub, which is defined as San Diego County, is the 19th largest Metropolitan Statistical Area in the United States. The hub's 1985 population was 2.1 million. By 2000, the population is expected to reach 2.7 million, which is 29 percent above the 1985 level.

Domestic and commuter air service in the San Diego Hub, as well as general aviation, is handled by 12 airports. San Diego International Airport, which is served by 20 commercial airlines, is the hub's only air carrier airport. Of the 12 airports, five have FAA towers. In addition to the commercial activity at San Diego International, there are commuter services at McClellan-Palomar and Borrego Valley Airports.

Total passenger enplanements in the hub are projected to reach nearly 8.3 million by the year 2000. This represents a 108 percent increase over the 4 million passengers enplaned in 1985. Commercial aircraft operations are expected to reach 209,800 by the year 2000, which is 55 percent over the 1985 level. For the period 1985 through 2000, general aviation itinerant operations at the 12 hub airports are projected to increase at a yearly rate of 3.2 percent, while local operations are forecast to grow at an annual rate of 2.8 percent.

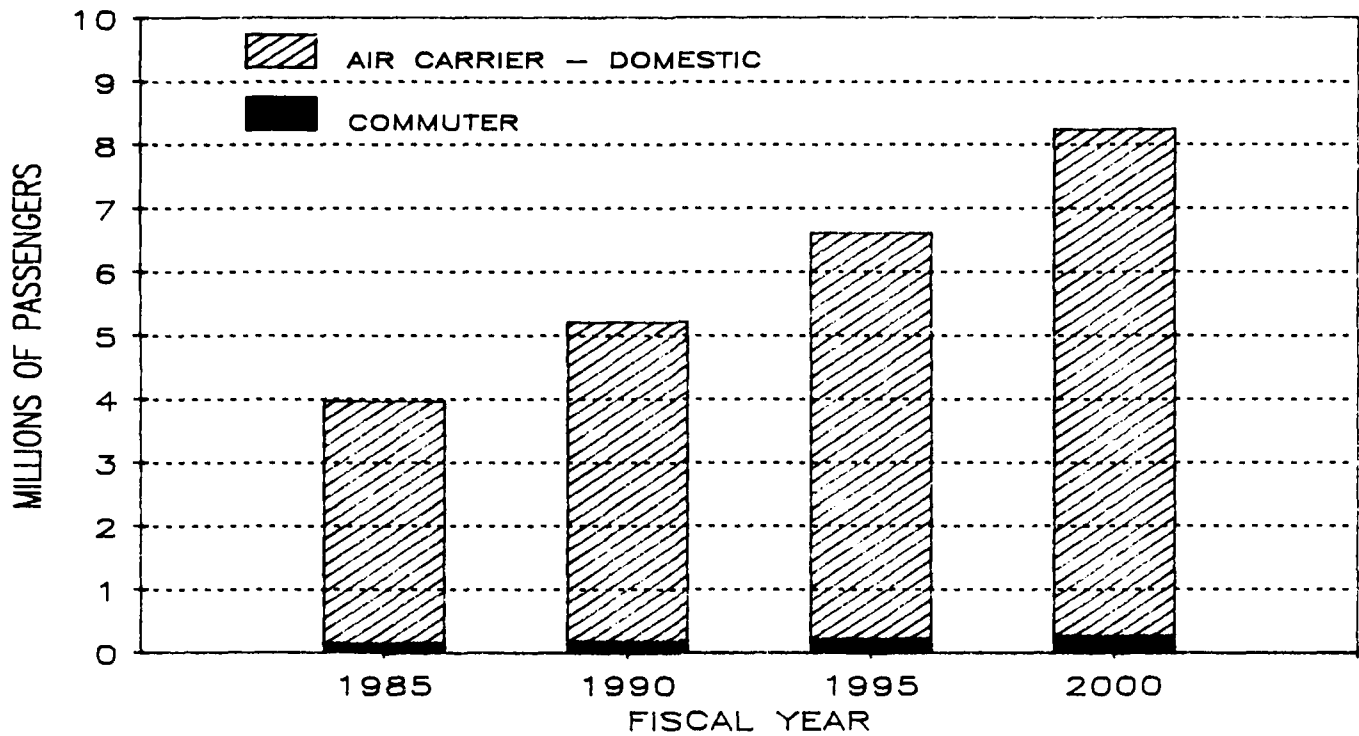
San Francisco-Oakland-San Jose Hub

The San Francisco Hub is the fifth largest Consolidated Metropolitan Statistical Area in the United States. The hub consists of the following counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma. The hub's 1985 population was 5.8 million. By 2000, the population is expected to reach 6.5 million, which is 12 percent above the 1985 level.

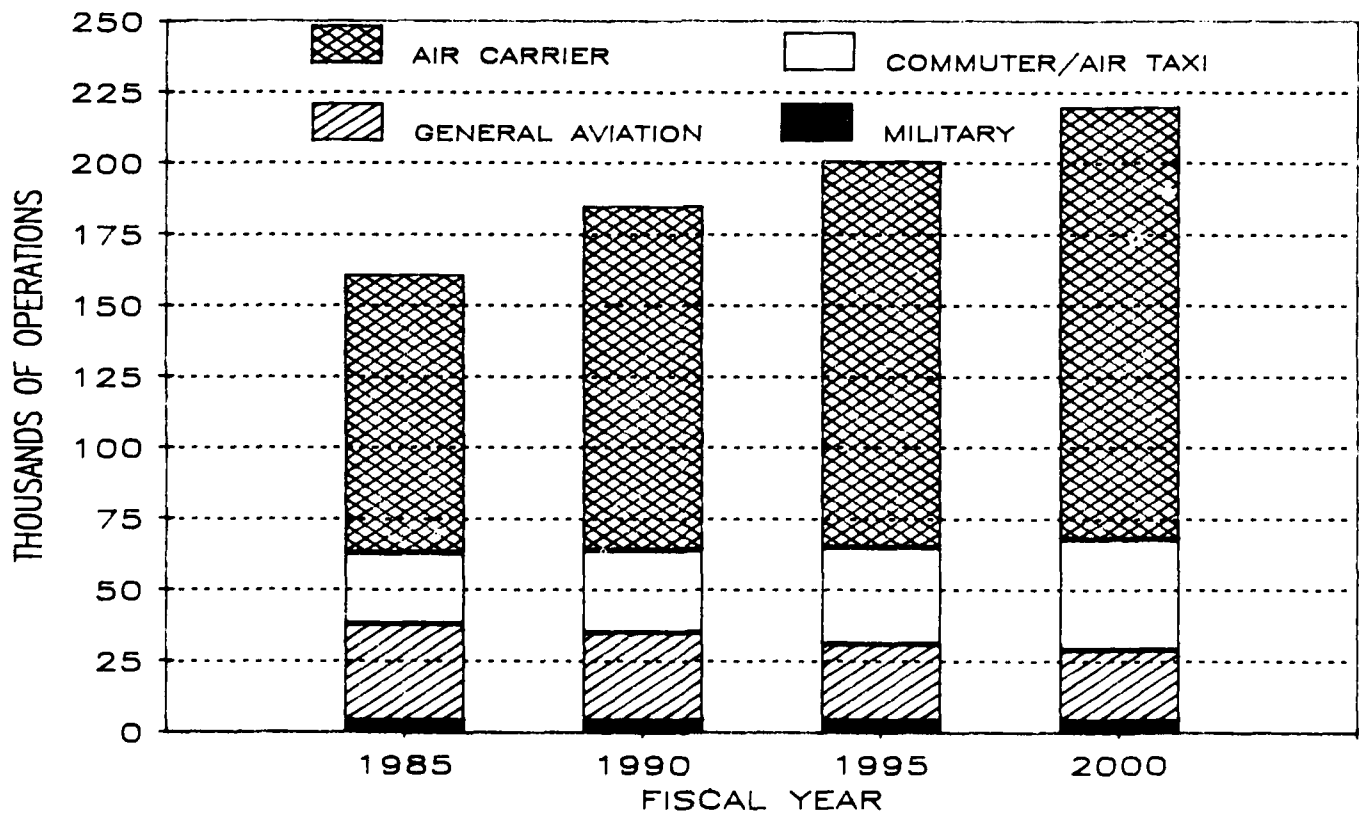
International, domestic, and commuter air service, as well as general aviation, is handled by 30 airports located within the hub. Of these 30 airports, 11 have FAA towers. San Francisco International Airport, which is served by 38 scheduled air carriers and 18 all cargo carriers, is the hub's primary air carrier airport. Oakland and San Jose International Airports are also major airports in the hub, which augment the passenger traffic at San Francisco International.

SAN DIEGO INTERNATIONAL AIRPORT

PASSENGER ENPLANEMENTS

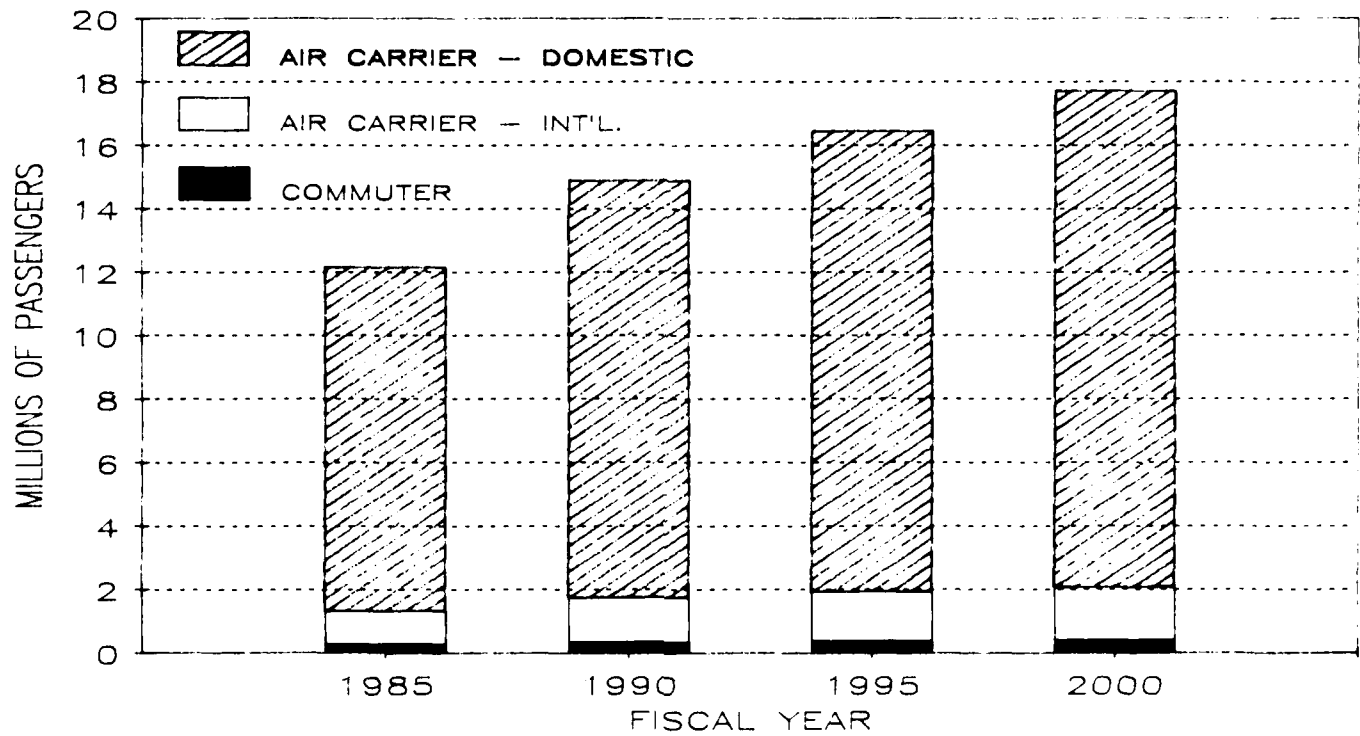


TOTAL AIRCRAFT OPERATIONS

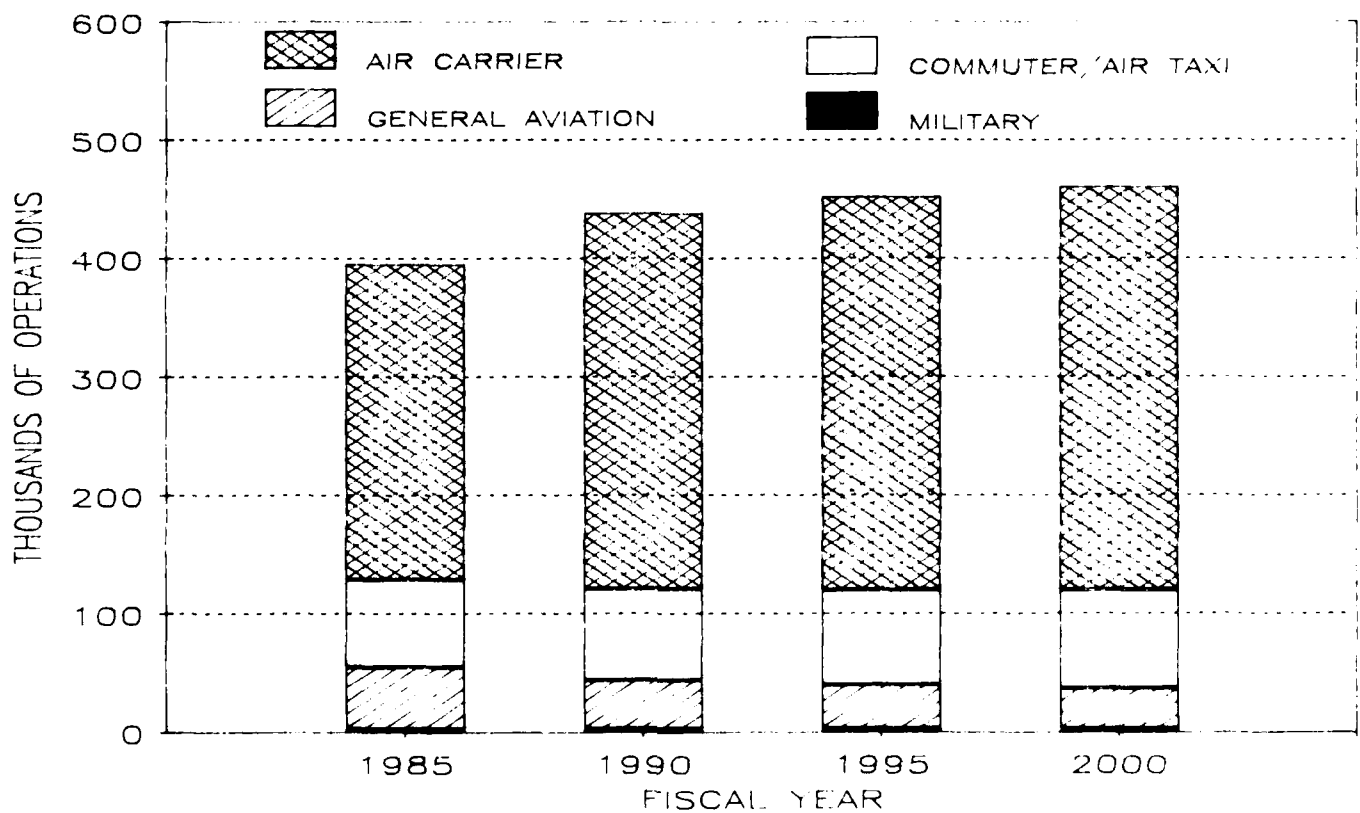


SAN FRANCISCO INTERNATIONAL AIRPORT

PASSENGER ENPLANEMENTS



TOTAL AIRCRAFT OPERATIONS



Total passenger enplanements in the hub are projected to reach nearly 28.5 million by the year 2000. This represents a 67 percent increase over the 17.0 million passengers enplaned in 1985. Commercial aircraft operations are expected to reach 778,200 by the year 2000, which is a 42 percent increase over the 1985 level. For the period 1985 through 2000, general aviation itinerant operations at the 30 hub airports are projected to increase at a yearly rate of 3.6 percent, while local operations are forecast to grow at an annual rate of 2.2 percent.

Tampa-St. Petersburg-Clearwater Hub

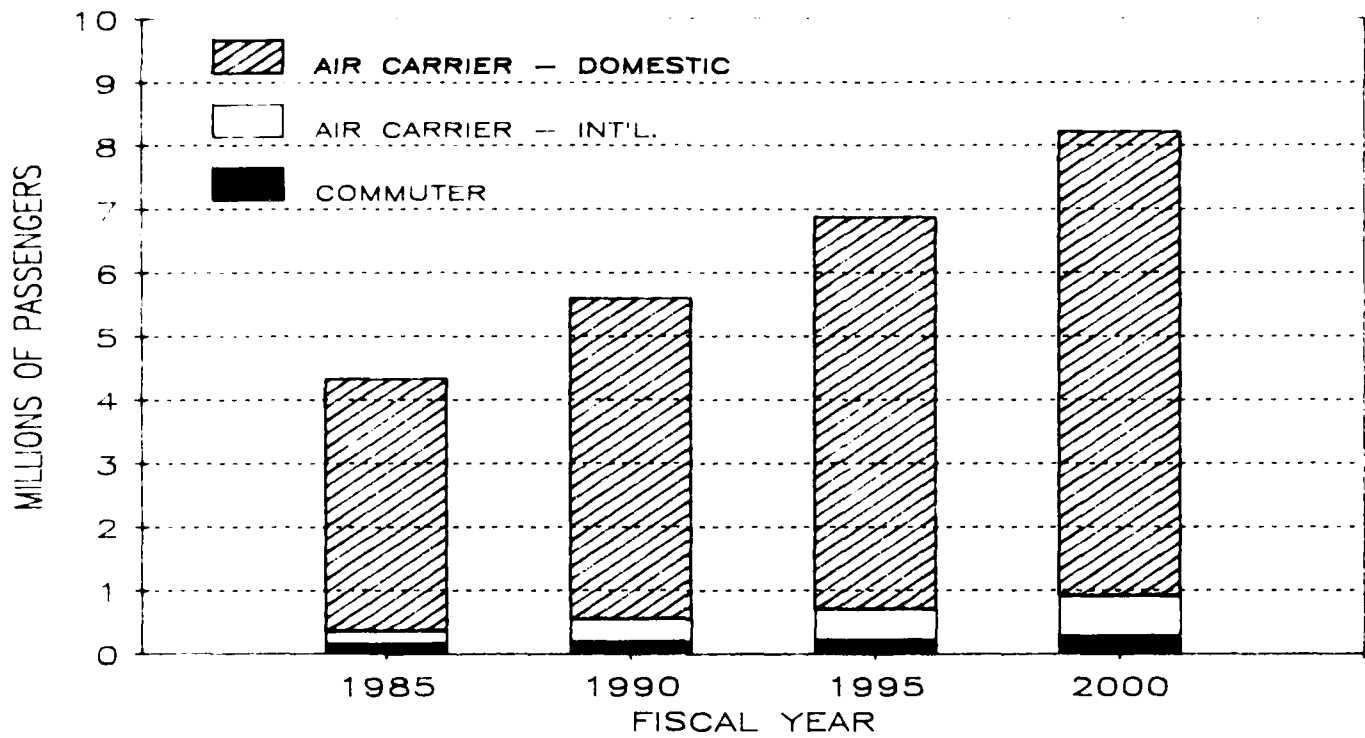
The Tampa-St. Petersburg-Clearwater Hub is the 20th largest Metropolitan Statistical Area in the United States. The hub consists of the following counties: Hernando, Hillsborough, Pasco, and Pinellas. The hub's 1985 population was 1.9 million. By 2000, the hub is expected to reach 2.4 million, which is 28 percent above the 1985 level.

Domestic, international, and commuter air service in Tampa, as well as general aviation operations, are handled by 17 airports located within the hub and one located outside (Lakeland Municipal located in Lake County). Of the 18 airports, five provide air traffic control services: three have FAA towers, one is military, and one is operated by the local municipality. Tampa International Airport is the hub's primary air carrier airport. St. Petersburg-Clearwater International Airport has provided commercial airline service since 1982, and in 1985 accounted for approximately 6.0 percent of the combined passenger traffic at the two airports. The two airports are served by 39 air carriers, which provide scheduled and nonscheduled passenger service. Four regional/commuter airlines also serve the hub, providing inter- and intra-state service.

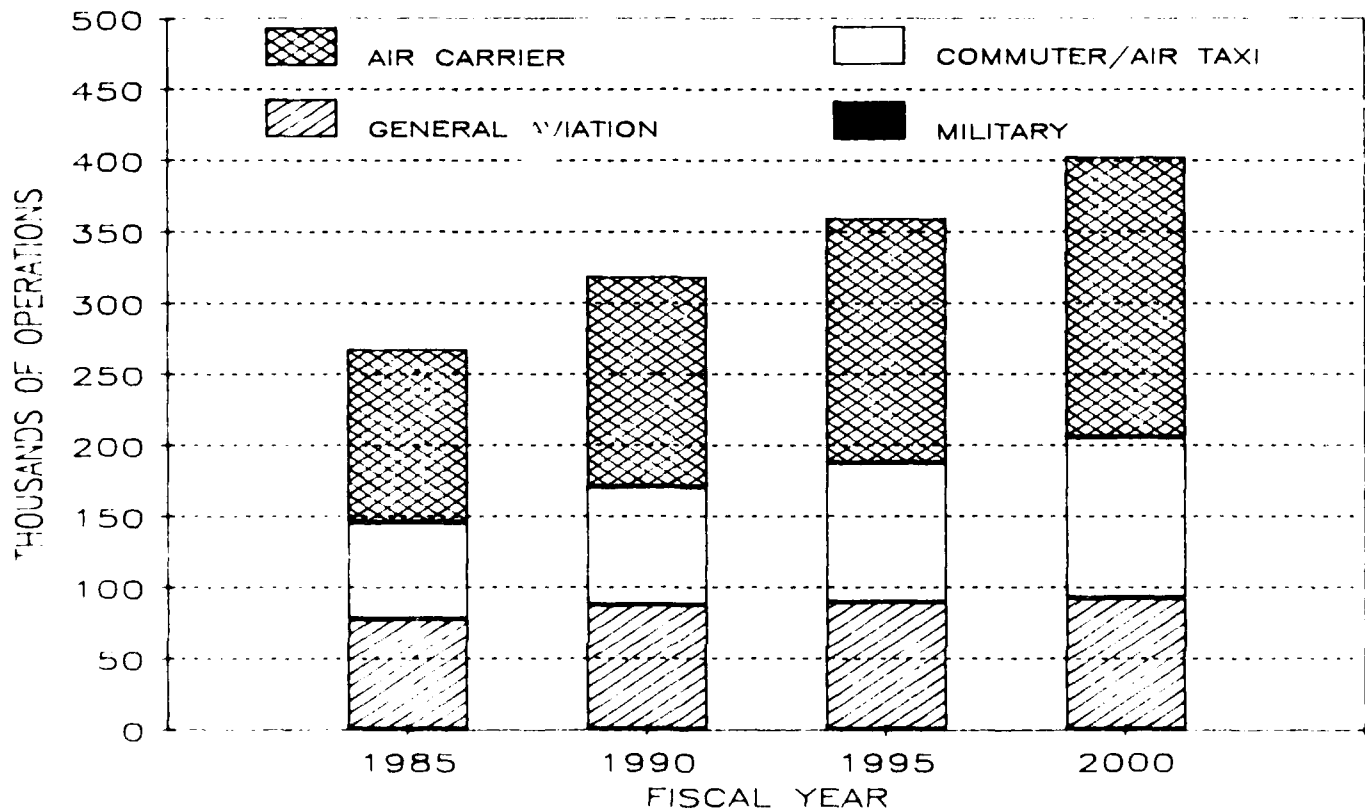
Total passenger enplanements in the hub are projected to reach 9 million by the year 2000. This represents an 87.7 percent increase over the 4.8 million passengers enplaned in 1985. Commercial aircraft operations are expected to reach 335,200 by the year 2000, which is a 69 percent increase over the 1985 level. For the period 1985 through 2000, general aviation itinerant operations at the 18 hub airports are projected to increase at a yearly rate of 3.4 percent, while local operations are forecast to grow at an annual rate of 2.9 percent.

TAMPA INTERNATIONAL AIRPORT

PASSENGER ENPLANEMENTS



TOTAL AIRCRAFT OPERATIONS



Chapter IX

Year-by-Year Data for FAA Aviation Forecasts

Fiscal Years 1987 - 1998

Chapter IX provides the detailed data for the National Aviation and FAA workload series forecasted by the FAA Office of Aviation Policy and Plans. The following should be noted with regard to the data contained in the Tables listed below:

- o Table 5 - Contains the unduplicated passenger traffic reported by U.S. scheduled air carriers reporting on RSPA Form 41 and commuter carriers reporting on RSPA Form 298-C.
- o Table 6 - San Juan and Virgin Island traffic is reported as domestic, beginning January 1, 1981.
 - Those carriers contained in the Air Carrier forecast data base can be found in Appendices A and B.
 - Includes the following traffic which is also reported as commuters/regionals traffic in Table 12.

	<u>ENPLANEMENTS</u> (Millions)	<u>RPM'S</u> (Millions)		<u>ENPLANEMENTS</u> (Millions)	<u>RPM'S</u> (Millions)
1980	4.199	627.4	1984	3.153	615.6
1981	5.642	906.2	1985	4.666	844.2
1982	4.478	732.1	1986E	6.648	1,100.9
1983	2.410	455.4			

- o Table 12 - Includes the duplicated traffic listed above for those air carriers and commuters/regionals reporting on both RSPA Forms 41 and 298-C.
 - Forecasts and historical data exclude Alaska and foreign territory traffic.
 - The forecasts exclude the following carriers because of the predominance of jet aircraft in their fleets : Altair (beginning in 1982) and Empire (1985).
- o Table 13 - Includes only aircraft with 60 seats or less. Aircraft also included with general aviation fleet shown in Tables 14 and 15.
- o Table 19 - Includes the rotorcraft fleet and hours flown shown in Tables 14 and 16.

TABLE 1

ECONOMIC FORECASTS USED IN DEVELOPING FAA FORECASTS

FISCAL YEAR	GROSS NATIONAL PRODUCT (Billions 1982\$)	CONSUMER PRICE INDEX (1967 = 100)	OIL AND GAS DEFLATOR (1982 = 100)
<u>Historical</u>			
1980	3,187.7	239.8	90.4
1981	3,243.8	266.3	103.2
1982	3,181.0	285.5	101.6
1983	3,227.7	295.3	97.5
1984	3,451.1	304.9	95.9
1985	3,559.7	315.9	95.5
1986E	3,656.7	322.7	82.6
<u>Forecast</u>			
1987	3,764.0	330.0	79.2
1988	3,892.5	342.2	89.6
1989	4,035.1	354.3	98.2
1990	4,180.4	366.2	105.1
1991	4,329.3	376.7	112.5
1992	4,477.5	385.6	120.4
1993	4,607.3*	404.1*	126.3*
1994	4,731.7*	424.3*	132.7*
1995	4,864.2*	446.4*	140.2*
1996	4,990.7*	469.1*	148.3*
1997	5,125.5*	492.6*	157.1*
1998	5,263.8*	517.2*	166.3*

Source: Office of Management and Budget, December 1986

* Based on consensus growth rates of Chase, DRI, Evans, and Wharton Forecasts contained in Table 2.

TABLE 2

ALTERNATIVE ECONOMIC FORECASTS

CALENDAR YEAR	GROSS NATIONAL PRODUCT (Billions 1982\$)				CONSUMER PRICE INDEX (1967 = 100)				FUEL PRICE INDEX (1982 = 100)			
	CHASE	DRI	EVANS	WHARTON	CHASE	DRI	EVANS	WHARTON	CHASE	DRI	EVANS(1)	WHARTON
Historical												
1980	3,187.2	3,187.2	3,187.2	3,187.2	246.8	246.8	246.8	246.8	94.8	94.8	369.1	94.8
1981	3,248.7	3,248.7	3,248.7	3,248.7	272.4	272.4	272.4	272.4	105.6	105.6	410.9	105.6
1982	3,166.0	3,166.0	3,166.0	3,166.0	289.1	289.1	289.1	289.1	100.0	100.0	389.3	100.0
1983	3,279.1	3,279.1	3,279.1	3,279.1	298.4	298.4	298.4	298.4	96.7	96.8	376.3	96.8
1984	3,489.9	3,489.9	3,489.9	3,489.9	311.1	311.1	311.1	311.1	95.2	95.2	370.3	95.2
1985	3,585.2	3,585.2	3,585.2	3,585.2	322.1	322.1	322.1	322.1	96.0	96.1	373.3	96.1
1986E	3,679.5	3,675.2	3,679.5	3,676.6	328.4	329.1	329.0	328.4	76.0	79.0	303.5	77.1
Forecast												
1987	3,769.5	3,770.9	3,772.2	3,776.2	339.5	341.4	341.6	339.8	74.8	79.4	306.1	81.6
1988	3,870.0	3,886.7	3,910.1	3,913.6	354.4	356.2	355.4	356.4	82.9	82.5	321.7	89.1
1989	3,974.5	3,961.3	4,065.8	4,006.0	370.2	370.3	371.2	374.9	85.7	86.9	341.6	97.3
1990	4,085.4	4,073.8	4,188.2	4,023.6	385.8	385.2	390.6	395.9	90.6	92.9	366.1	106.0
1991	4,198.3	4,202.1	4,276.1	4,230.9	402.4	402.5	412.8	414.8	95.7	99.7	392.6	114.4
1992	4,311.8	4,310.3	4,353.2	4,343.8	420.0	421.8	436.2	432.6	100.8	107.4	413.0	121.1
1993	4,432.3	4,414.7	4,475.9	4,489.9	438.8	442.4	459.3	452.4	106.2	114.5	429.6	128.3
1994	4,554.1	4,520.5	4,618.4	4,604.4	459.3	465.8	483.0	474.5	111.7	124.1	446.8	136.2
1995	4,681.7	4,629.5	4,760.4	4,742.7	479.1	491.8	507.7	500.8	117.5	136.2	466.6	144.6
1996	4,810.5*	4,740.9	4,898.2	4,856.7	500.2*	519.5	533.3	527.9	123.6*	149.4	488.3	153.6
1997	4,942.7*	4,854.4	5,040.2*	4,992.7*	522.2*	549.0	559.9*	553.8*	130.1*	164.8	510.3*	163.1*
1998	5,078.7*	4,972.9	5,186.4*	5,132.5*	545.2*	580.2	588.0*	580.3*	136.8*	182.4	533.2*	173.2*

Source: Chase Econometrics, November 1986; Data Resources, Inc., Fall, 1986; Evans Economics, Inc., September 1986; and Wharton Econometric Associates, December 1986

* Extrapolated to 1998 for forecast purposes

(1) Component of Consumer Price Index (1967 = 100)

TABLE 3

BASELINE AIR CARRIER FORECAST ASSUMPTIONS - DOMESTIC OPERATIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE		AVERAGE JET FUEL PRICE	
			CURRENT\$ (Cents)	1967\$ (Cents)	1967\$ (Cents)	(Cents)
Historical*						
1980	141.0	730	10.82	4.51	83.2	
1981	143.6	749	12.93	4.86	100.8	
1982	150.7	761	12.47	4.37	99.3	
1983	153.4	770	11.90	4.03	90.3	
1984	153.2	759	13.00	4.26	85.1	
1985	152.0	759	12.36	3.91	80.7	
1986E	152.8	764	11.26	3.49	63.5	
Forecast						
1987	153	765	11.60	3.52	61.0	
1988	154	767	12.13	3.55	68.9	
1989	155	769	12.60	3.56	75.6	
1990	157	771	12.99	3.55	80.9	
1991	159	774	13.49	3.58	86.5	
1992	161	777	13.99	3.63	92.6	
1993	163	780	14.51	3.59	97.1	
1994	165	783	15.07	3.55	102.0	
1995	168	786	15.70	3.52	107.8	
1996	171	789	16.37	3.49	114.0	
1997	174	792	17.06	3.46	120.7	
1998	177	795	17.77	3.44	127.9	

* Source: RSPA, Form 41

TABLE 4

BASELINE AIR CARRIER FORECAST ASSUMPTIONS - INTERNATIONAL OPERATIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE		JET FUEL PRICE	
			CURRENT\$ (Cents)	1967\$ (Cents)	1967\$ (Cents)	1967\$ (Cents)
Historical*						
1980	257.4	2,250	8.67	3.62		96.8
1981	264.7	2,375	9.75	3.66		113.1
1982	271.9	2,495	9.92	3.47		109.6
1983	279.2	2,507	9.99	3.38		99.7
1984	283.1	2,594	9.63	3.16		91.3
1985	290.5	2,636	9.38	2.97		84.9
1986E	290.0	2,605	9.63	2.98		69.1
Forecast						
1987	291	2,615	9.72	2.95		66.3
1988	292	2,625	10.06	2.94		75.0
1989	294	2,635	10.42	2.94		82.2
1990	296	2,645	10.68	2.92		88.0
1991	298	2,655	11.03	2.93		94.1
1992	301	2,665	11.40	2.96		100.7
1993	304	2,675	11.77	2.91		105.7
1994	307	2,685	12.14	2.86		111.1
1995	310	2,690	12.54	2.81		117.3
1996	313	2,695	12.97	2.77		124.1
1997	316	2,700	13.42	2.72		131.4
1998	319	2,705	13.95	2.70		139.2

* Source: RSPA, Form 41

TABLE 5

UNITED STATES COMMERCIAL AIR CARRIERS AND REGIONALS/COMMUTERS
TOTAL SCHEDULED PASSENGER TRAFFIC 1/

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (Millions)			REVENUE PASSENGER MILES (Billions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
<u>Historical*</u>						
1980	287.8	24.2	312.0	204.4	54.2	258.6
1981	274.7	21.2	295.9	199.1	50.3	249.4
1982	286.0	19.8	305.8	209.5	49.2	258.7
1983	308.1	21.2	329.3	225.8	52.8	278.6
1984	333.8	23.4	357.2	240.5	60.2	300.7
1985	369.9	24.8	394.7	268.8	64.8	333.6
1986E	404.3	24.8	429.1	297.4	64.1	361.5
<u>Forecast</u>						
1987	427.9	25.8	453.7	314.8	66.7	381.5
1988	453.2	27.2	480.4	337.1	70.6	407.7
1989	466.7	28.2	494.9	345.0	73.4	418.4
1990	493.6	29.9	523.5	365.3	78.1	443.4
1991	518.7	31.5	550.2	385.3	82.7	468.0
1992	542.4	32.9	575.3	404.2	86.9	491.1
1993	568.8	34.4	603.2	425.3	90.8	516.1
1994	594.1	36.1	630.2	445.6	95.9	541.5
1995	619.4	37.8	657.2	466.0	100.5	566.5
1996	634.2	39.3	673.5	478.5	104.6	583.1
1997	665.8	41.3	707.1	503.9	110.3	614.2
1998	694.3	43.3	737.6	527.4	115.5	642.9

* Source: RSPA, Forms 41 and 298-C

1/ Sum of Table's 6 and 11 less duplicated traffic. See note on page 123.

TABLE 6

UNITED STATES COMMERCIAL AIR CARRIERS
SCHEDULED PASSENGER TRAFFIC

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (Millions)			REVENUE PASSENGER MILES (Billions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
<u>Historical*</u>						
1980	278.2	24.1	302.3	203.2	54.2	257.4
1981	264.3	21.2	285.5	198.0	50.3	248.3
1982	272.8	19.7	292.5	207.8	49.2	257.0
1983	290.3	21.1	311.4	223.6	52.8	276.4
1984	313.4	23.3	336.7	237.7	60.3	298.0
1985	350.4	24.6	375.0	265.8	64.8	330.6
1986E	385.0	24.6	409.6	294.3	64.1	358.4
<u>Forecast</u>						
1987	407.1	25.5	432.6	311.4	66.7	378.1
1988	430.9	26.9	457.8	330.5	70.5	401.0
1989	443.3	27.8	471.1	340.9	73.3	414.2
1990	468.5	29.5	498.0	361.2	77.9	439.1
1991	492.0	31.1	523.1	380.8	82.5	463.3
1992	513.9	32.5	546.4	399.3	86.7	486.0
1993	538.6	33.9	572.5	420.1	90.6	510.7
1994	561.9	35.6	597.5	440.0	95.7	535.7
1995	585.1	37.3	622.4	459.9	100.3	560.2
1996	598.2	38.7	636.9	472.0	104.4	576.4
1997	627.7	40.7	668.4	497.1	110.0	607.1
1998	654.2	42.6	696.8	520.1	115.2	635.3

* Source: RSPA, Form 41

TABLE 7

UNITED STATES COMMERCIAL AIR CARRIERS
SCHEDULED PASSENGER CAPACITY, TRAFFIC AND LOAD FACTORS

FISCAL YEAR	DOMESTIC			INTERNATIONAL		
	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR
<u>Historical*</u>						
1980	349.0	203.2	58.2	86.8	54.2	62.5
1981	343.4	198.0	57.7	79.5	50.3	63.3
1982	355.9	207.8	58.4	79.6	49.2	61.8
1983	374.4	223.6	59.7	82.6	52.8	64.0
1984	411.7	237.7	57.8	91.1	60.3	66.2
1985	436.7	265.8	60.9	98.6	64.8	65.8
1986	488.3	294.3	60.3	108.3	64.1	59.2
<u>Forecast</u>						
1987	524.2	311.4	59.4	109.7	66.7	60.8
1988	550.8	330.5	60.0	115.4	70.5	61.1
1989	575.8	340.9	59.2	120.4	73.3	60.9
1990	605.0	361.2	59.7	126.7	77.9	61.5
1991	632.6	380.8	60.2	132.9	82.5	62.1
1992	658.9	399.3	60.6	139.2	86.7	62.3
1993	687.5	420.1	61.1	145.4	90.6	62.3
1994	714.3	440.0	61.6	152.1	95.7	62.9
1995	743.0	459.9	61.9	159.0	100.3	63.1
1996	773.8	472.0	61.0	166.0	104.4	62.9
1997	804.4	497.1	61.8	173.2	110.0	63.5
1998	837.5	520.1	62.1	180.8	115.2	63.7

* Source: RSPA, Form 41

TABLE 8

UNITED STATES COMMERCIAL AIR CARRIERS
LARGE JET AIRCRAFT

AS OF JANUARY 1	NARROW BODY			WIDE BODY			TOTAL
	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE	
Historical*							
1980	615	1,029	380	12	227	131	2,394
1981	663	1,097	297	19	255	144	2,475
1982	730	1,096	218	25	267	147	2,483
1983	839	1,057	199	43	277	141	2,556
1984	962	1,122	161	83	271	146	2,745
1985	1,074	1,161	179	91	277	156	2,938
1986	1,238	1,195	171	111	293	160	3,168
Forecast							
1987	1,416	1,134	143	125	297	163	3,278
1988	1,580	1,083	148	144	300	168	3,423
1989	1,714	1,017	149	166	300	176	3,522
1990	1,818	941	148	190	303	186	3,586
1991	1,897	858	146	226	309	196	3,632
1992	1,951	808	144	260	315	205	3,683
1993	2,032	755	142	300	315	212	3,756
1994	2,120	701	140	346	308	220	3,835
1995	2,211	647	139	393	297	227	3,914
1996	2,302	592	138	444	281	234	3,991
1997	2,407	536	133	495	266	241	4,078
1998	2,517	480	127	537	248	250	4,159

* Source: FAA Aircraft Utilization and Propulsion Reliability Report

TABLE 9

UNITED STATES COMMERCIAL AIR CARRIERS
TOTAL AIRBORNE HOURS
(Thousands)

FISCAL YEAR	NARROW BODY			WIDE BODY			TOTAL
	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE	
Historical*							
1980	1,579	2,994	690	38	712	525	6,538
1981	1,673	2,806	388	60	716	501	6,144
1982	1,860	2,635	254	67	742	510	6,068
1983	2,188	2,573	360	160	772	533	6,586
1984	2,551	2,805	342	260	787	545	7,290
1985	2,917	2,884	261	309	829	539	7,739
1986E	3,495	2,953	284	378	882	546	8,538
Forecast							
1987	3,984	2,894	284	430	890	556	9,038
1988	4,430	2,781	291	500	892	579	9,473
1989	4,789	2,636	295	578	898	615	9,811
1990	5,066	2,470	294	680	914	661	10,085
1991	5,275	2,319	292	800	937	711	10,334
1992	5,486	2,187	290	929	949	753	10,594
1993	5,754	2,047	288	1,078	940	783	10,890
1994	6,025	1,900	287	1,240	915	808	11,175
1995	6,326	1,749	286	1,411	877	826	11,475
1996	6,611	1,594	281	1,588	832	841	11,747
1997	6,935	1,438	269	1,752	784	860	12,038
1998	7,260	1,274	252	1,900	730	880	12,296

* Source: RSPA, Form 41

TABLE 10

TOTAL JET FUEL AND AVIATION GASOLINE FUEL CONSUMPTION
UNITED STATES CIVIL AVIATION AIRCRAFT
(Millions of Gallons)

FISCAL YEAR	JET FUEL				AVIATION GASOLINE			
	U.S. AIR CARRIERS		GENERAL		AIR		GENERAL	
	DOMESTIC	INT'L.	TOTAL	AVIATION	TOTAL	CARRIER	AVIATION	TOTAL
<u>Historical*</u>								
1980	9,126	2,136	11,262	758	12,020	13	533	546
1981	8,376	1,881	10,257	761	11,018	11	497	508
1982	8,242	1,797	10,039	855	10,894	9	458	467
1983	8,697	1,972	10,669	681	11,350	7	433	440
1984	9,478	2,176	11,654	707	12,361	6	454	460
1985	9,906	2,387	12,293	702	12,995	5	436	441
1986E	10,733	2,525	13,258	715	13,973	5	420	425
<u>Forecast</u>								
1987	11,580	2,560	14,140	754	14,894	4	416	420
1988	12,090	2,630	14,720	785	15,505	4	414	418
1989	12,450	2,700	15,150	801	15,951	3	410	413
1990	12,880	2,780	15,660	812	16,472	3	408	411
1991	13,200	2,850	16,050	843	16,893	2	407	409
1992	13,480	2,910	16,390	911	17,301	2	408	410
1993	13,700	2,970	16,670	962	17,632	2	411	413
1994	13,900	3,030	16,930	1,002	17,932	2	412	414
1995	14,100	3,090	17,190	1,015	18,205	2	413	415
1996	14,310	3,150	17,460	1,045	18,505	2	415	417
1997	14,520	3,200	17,720	1,078	18,798	2	417	419
1998	14,730	3,260	17,990	1,096	19,086	2	418	420

* Source: Air carrier jet fuel, RSPA Form 41; All others, FAA APO estimates

E = Estimate

TABLE 11

BASELINE REGIONALS/COMMUTERS FORECAST ASSUMPTIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT	AVERAGE PASSENGER 48 STATES	TRIP LENGTH	AVERAGE PASSENGER LOAD FACTOR (Percent)
	(Seats)	(Miles)	HA/P.R./V.I. (Miles)	
Historical*				
1980	15.1	135.2	71.9	45.5
1981	15.9	141.1	76.0	43.4
1982	16.9	146.0	95.2	44.0
1983	18.2	151.9	96.0	45.6
1984	19.1	160.5	98.9	46.2
1985	19.4	162.4	98.9	44.3
1986E	20.2	167.0	96.0	45.0
Forecast				
1987	20.4	170.3	99.0	45.5
1988	20.9	175.5	99.0	46.1
1989	22.1	179.0	99.0	44.9
1990	22.9	182.5	99.0	45.5
1991	23.7	185.5	99.0	45.7
1992	24.9	188.5	99.0	45.9
1993	25.9	191.0	99.0	46.1
1994	27.0	193.5	99.0	46.2
1995	27.5	196.0	99.0	46.3
1996	28.0	198.5	99.0	45.7
1997	28.5	200.0	99.0	46.0
1998	28.8	202.0	99.0	46.4

* Source: RSPA, Form's 298-C and 41

TABLE 12
UNITED STATES REGIONALS/COMMUTERS
SCHEDULED PASSENGER TRAFFIC
(Millions)

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS			REVENUE PASSENGER MILES		
	48 STATES	PUERTO RICO/ VIRGIN ISLANDS	HAWAII/ TOTAL	48 STATES	PUERTO RICO/ VIRGIN ISLANDS	HAWAII/ TOTAL
Historical*						
1980	12.4	1.5	13.9	1,676.1	107.8	1,783.9
1981	14.2	1.8	16.0	2,004.0	136.8	2,140.8
1982	15.6	2.2	17.8	2,278.3	187.4	2,465.7
1983	17.8	2.5	20.3	2,703.1	240.1	2,943.2
1984	21.0	2.8	23.8	3,369.6	276.8	3,646.4
1985	21.9	2.5	24.4	3,555.6	247.2	3,802.8
1986E	23.3	2.8	26.1	3,891.1	268.7	4,159.8
Forecast						
1987	25.4	2.9	28.3	4,326.1	292.9	4,619.0
1988	27.2	3.2	30.4	4,773.6	316.8	5,090.4
1989	28.8	3.3	32.1	5,155.2	326.7	5,481.9
1990	31.0	3.6	34.6	5,657.5	356.4	6,013.9
1991	33.1	3.9	37.0	6,140.1	386.1	6,526.2
1992	35.3	4.2	39.5	6,654.1	415.8	7,069.9
1993	37.6	4.5	42.1	7,181.6	445.5	7,627.1
1994	40.1	4.8	44.9	7,759.4	475.2	8,234.6
1995	42.9	5.1	48.0	8,408.4	504.9	8,913.3
1996	45.3	5.3	50.6	8,992.0	524.7	9,516.7
1997	48.2	5.6	53.8	9,640.0	554.4	10,194.4
1998	51.0	5.9	56.9	10,302.0	584.1	10,886.1

* Source: RSPA, Form's 298-C and 41

E = Estimate

TABLE 13

UNITED STATES REGIONALS/COMMUTERS
PASSENGER AIRCRAFT

AS OF JANUARY 1	LESS THAN 15 SEATS	15 TO 19 SEATS	20 TO 40 SEATS	MORE THAN 40 SEATS	TOTAL
<u>Historical*</u>					
1980	861	365	101	86	1,413
1981	734	383	99	97	1,313
1982	716	433	117	122	1,388
1983	701	493	125	175	1,494
1984	569	533	147	172	1,421
1985	624	561	162	204	1,551
1986E	564	615	200	159	1,538
<u>Forecast</u>					
1987	499	589	228	185	1,501
1988	477	612	249	219	1,557
1989	467	634	279	253	1,633
1990	451	653	307	294	1,705
1991	414	669	332	321	1,736
1992	369	670	366	370	1,775
1993	329	682	397	416	1,824
1994	293	692	440	476	1,901
1995	261	699	495	493	1,948
1996	234	703	560	508	2,005
1997	208	703	610	525	2,046
1998	186	707	662	532	2,087

* Source: FAA Aircraft Utilization and Propulsion Reliability Report

E = Estimate

TABLE 14

ACTIVE GENERAL AVIATION AIRCRAFT
(Thousands)

AS OF JANUARY 1	FIXED WING							OTHER	TOTAL
	PISTON		TURBOPROP	TURBOJET	ROTORCRAFT				
	SINGLE ENGINE	MULTI- ENGINE			PISTON	TURBINE			
Historical*									
1980	168.4	25.1	3.5	2.7	3.1	2.7	4.8	210.3	
1981	168.4	24.6	4.1	3.0	2.8	3.2	4.9	211.0	
1982	167.9	25.5	4.7	3.2	3.3	3.7	5.0	213.3	
1983	164.2	25.0	5.2	4.0	2.4	3.7	5.2	209.7	
1984	166.4	25.1	5.5	3.9	2.5	4.0	5.9	213.3	
1985	171.9	25.5	5.8	4.3	2.9	4.2	6.2	220.9	
1986	164.4	23.8	5.4	4.4	2.9	3.6	6.3	210.7	
Forecast									
1987	163.7	23.6	5.5	4.6	2.8	3.8	6.4	210.4	
1988	162.3	23.5	5.6	4.8	2.7	4.0	6.7	209.6	
1989	161.0	23.4	5.7	5.0	2.6	4.2	7.0	208.9	
1990	160.0	23.3	5.9	5.2	2.6	4.4	7.3	208.7	
1991	159.4	23.2	6.1	5.4	2.5	4.7	7.6	208.9	
1992	158.8	23.2	6.3	5.6	2.5	5.0	7.9	209.3	
1993	160.0	23.3	6.6	5.9	2.5	5.3	8.3	211.9	
1994	160.5	23.4	6.9	6.2	2.4	5.6	8.6	213.6	
1995	161.0	23.5	7.1	6.4	2.4	5.9	8.9	215.2	
1996	161.5	23.6	7.3	6.6	2.3	6.1	9.2	216.6	
1997	162.0	23.7	7.5	6.8	2.2	6.3	9.5	218.0	
1998	162.5	23.8	7.7	7.0	2.1	6.5	9.7	219.3	

* Source: FAA Statistical Handbook of Aviation

Notes: Detail may not add to total because of independent rounding.

An active aircraft must have a current registration and it must have been flown at least one hour during the previous calendar year.

TABLE 15

ACTIVE GENERAL AVIATION AIRCRAFT
BY FAA REGION
 (Thousands)

AS OF JANUARY 1	FAA REGION							TOTAL
	ANE	AEA	ASO	AGL	ACE	ASW	AWP	
Historical*								
1980	7.4	22.9	29.7	39.7	14.1	30.9	35.3	210.3
1981	7.4	23.0	29.8	39.9	14.1	31.0	35.4	211.0
1982**	7.0	21.2	32.1	40.0	14.0	32.2	36.7	213.2
1983	7.7	22.8	32.2	37.0	12.8	34.0	34.4	209.8
1984	7.8	23.2	32.7	37.6	13.0	34.6	35.0	213.3
1985	8.2	23.9	33.3	38.8	13.1	34.6	37.6	220.9
1986	8.0	22.7	32.8	37.5	12.4	32.7	36.9	210.7
Forecast								
1987	8.0	22.7	32.8	37.5	12.3	32.7	36.8	210.4
1988	8.0	22.6	32.6	37.3	12.3	32.5	36.7	209.6
1989	7.9	22.5	32.5	37.2	12.3	32.5	36.6	208.9
1990	7.9	22.5	32.5	37.2	12.3	32.4	36.5	208.7
1991	7.9	22.5	32.5	37.2	12.3	32.5	36.6	208.9
1992	8.0	22.5	32.6	37.3	12.3	32.5	36.6	209.3
1993	8.1	22.8	33.0	37.7	12.5	32.9	37.1	211.9
1994	8.1	23.0	33.3	38.0	12.5	33.2	37.4	213.6
1995	8.2	23.2	33.5	38.3	12.7	33.4	37.7	215.2
1996	8.2	23.3	33.7	38.6	12.8	33.6	37.9	216.6
1997	8.3	23.5	33.9	38.8	12.8	33.9	38.2	218.0
1998	8.3	23.7	34.1	39.0	12.9	34.0	38.4	219.3

* Source: FAA Statistical Handbook of Aviation

** Regional totals were adjusted so that they sum to the national total.

Notes: Detail may not add to total because of independent rounding.

TABLE 16

GENERAL AVIATION HOURS FLOWN
(Millions)

Fiscal Year Historical*	FIXED WING										TOTAL
	PISTON			MULTI-ENGINE			ROTORCRAFT				
	SINGLE-ENGINE	TURBOPROP	TURBOJET	PISTON		TURBINE		OTHER			
				PISTON	TURBINE	PISTON	TURBINE				
1980	28.8	6.6	2.1	1.3	.9	1.8	.4	41.9			
1981	27.9	6.4	2.2	1.5	.8	1.8	.4	41.0			
1982	25.2	6.0	2.1	1.6	.6	1.8	.4	37.7			
1983	23.8	5.8	2.2	1.5	.6	1.7	.4	36.0			
1984	23.4	5.7	2.4	1.6	.6	1.9	.4	36.0			
1985	23.4	5.7	2.6	1.8	.6	1.7	.4	36.2			
1986	22.4	4.8	2.1	1.7	.6	1.8	.4	33.8			
Forecast											
1987	22.2	4.8	2.2	1.8	.6	1.9	.4	33.9			
1988	21.9	4.8	2.2	1.9	.6	1.9	.4	33.7			
1989	21.8	4.7	2.3	1.9	.6	2.0	.4	33.7			
1990	21.7	4.7	2.4	2.0	.6	2.2	.4	34.0			
1991	21.6	4.7	2.4	2.1	.6	2.3	.4	34.1			
1992	21.8	4.7	2.6	2.2	.6	2.5	.4	34.8			
1993	21.9	4.8	2.7	2.3	.5	2.6	.5	35.3			
1994	21.9	4.8	2.8	2.4	.5	2.7	.5	35.6			
1995	22.0	4.8	2.8	2.4	.5	2.8	.5	35.8			
1996	22.0	4.9	2.9	2.5	.5	2.9	.6	36.3			
1997	22.1	4.9	2.9	2.6	.5	3.0	.6	36.6			
1998	22.1	4.9	3.0	2.6	.5	3.1	.6	36.8			

* Source: FAA Statistical Handbook of Aviation

E = Estimate

Notes: Detail may not add to total because of independent rounding.

TABLE 17

ACTIVE PILOTS BY TYPE OF CERTIFICATE
(Thousands)

AS OF JANUARY 1	STUDENTS	PRIVATE	COMMERCIAL	AIRLINE TRANSPORT	HELICOPTER	GLIDER	LIGHTER- THAN-AIR	TOTAL	INSTRUMENT RATED(1)
<u>Historical*</u>									
1980	210.2	343.3	182.1	63.7	5.2	6.8	3.4	814.7	247.1
1981	199.8	357.5	183.4	69.6	6.0	7.0	3.7	827.0	260.5
1982	179.9	328.6	168.6	70.3	6.5	7.4	3.0	764.2	252.5
1983	156.4	322.1	165.1	73.5	7.0	7.8	1.4	733.3	255.1
1984	147.2	318.6	159.5	75.9	7.2	8.2	1.3	718.0	254.3
1985	150.1	320.1	155.9	79.2	7.5	8.4	1.2	722.4	256.6
1986	146.7	311.1	151.6	82.7	8.1	8.2	1.1	709.5	258.6
<u>Forecast</u>									
1987	145.2	308.0	148.6	85.2	8.3	8.3	1.1	704.7	260.4
1988	143.7	304.9	145.6	88.9	8.4	8.4	1.2	701.1	261.7
1989	142.3	303.4	144.1	91.5	8.5	8.6	1.2	699.6	263.0
1990	140.9	301.9	142.7	93.2	8.7	8.8	1.2	697.4	264.7
1991	139.5	300.4	141.3	94.4	8.8	8.9	1.2	694.5	266.1
1992	138.1	298.9	139.8	95.8	9.0	9.0	1.2	691.8	267.4
1993	139.1	300.8	138.5	97.7	9.3	9.1	1.3	695.8	268.7
1994	139.5	301.7	138.5	99.7	9.4	9.2	1.4	699.4	270.1
1995	139.9	302.7	140.0	102.5	9.5	9.3	1.5	705.4	271.4
1996	140.4	303.6	141.4	104.6	9.6	9.4	1.6	710.6	272.8
1997	140.8	304.5	142.8	106.8	9.7	9.5	1.7	715.8	274.1
1998	141.2	305.5	144.3	108.1	9.8	9.6	1.8	720.3	275.5

* Source: FAA Statistical Handbook of Aviation.

(1) Instrument rated pilots should not be added to other categories in deriving total.

Notes: Detail may not add to total because of independent rounding.

TABLE 18

GENERAL AVIATION AIRCRAFT FUEL CONSUMPTION
(Millions of Gallons)

FISCAL YEAR	FIXED WING								OTHER	TOTAL
	Piston		TURBOPROP	TURBOJET	ROTORCRAFT		PISTON			
	SINGLE ENGINE	MULTI-ENGINE			PISTON	TURBINE				
Historical*										
1980	287.6	231.1	223.9	474.6	13.3	59.7	.8		1,291.0	
1981	276.5	206.1	219.6	483.2	13.3	57.8	.8		1,257.3	
1982	251.2	197.4	230.8	562.1	9.7	62.5	.5		1,314.2	
1983	235.1	189.3	230.9	396.2	7.8	54.2	.4		1,113.9	
1984	248.8	196.3	236.4	408.0	8.5	62.9	.2		1,161.1	
1985	249.4	178.4	210.2	433.2	8.7	58.9	.1		1,138.9	
1986E	242.9	168.8	200.6	453.5	8.7	61.6	.1		1,136.2	
Forecast										
1987	239.7	167.9	207.7	480.6	8.7	66.0	.1		1,170.7	
1988	237.5	167.9	210.1	507.7	8.7	66.9	.1		1,198.8	
1989	236.2	165.3	217.3	514.4	8.7	69.5	.1		1,211.5	
1990	235.1	164.4	222.0	514.4	8.7	75.7	.1		1,220.4	
1991	233.9	164.4	229.2	534.7	8.7	80.1	.1		1,251.1	
1992	235.4	164.4	243.6	582.1	8.7	86.2	.1		1,320.5	
1993	236.7	167.0	255.5	615.9	7.7	90.6	.2		1,373.6	
1994	236.9	167.9	265.1	643.0	7.3	94.2	.2		1,414.6	
1995	237.7	167.9	267.5	649.8	7.3	97.7	.2		1,428.1	
1996	238.0	170.5	274.6	670.1	7.3	101.2	.2		1,461.9	
1997	238.8	171.4	277.0	697.1	7.3	104.7	.2		1,496.5	
1998	239.1	171.4	284.2	703.9	7.3	108.3	.3		1,514.5	

* Source: FAA APO Estimates

E = Estimate

TABLE 19

ACTIVE ROTORCRAFT FLEET AND HOURS FLOWN

AS OF JANUARY 1	ACTIVE FLEET (Thousands)		HOURS FLOWN(1) (Millions)		
	PISTON	TURBINE	TOTAL	PISTON	TOTAL
<u>Historical*</u>					
1980	3.1	2.7	5.8	.9	2.7
1981	2.8	3.2	6.0	.8	2.6
1982	3.3	3.7	7.0	.6	2.4
1983	2.4	3.7	6.1	.6	2.3
1984	2.5	4.0	6.5	.6	2.5
1985	2.9	4.2	7.1	.6	2.3
1986	2.9	3.6	6.5	.6	2.4
<u>Forecast</u>					
1987	2.8	3.8	6.6	.6	2.5
1988	2.7	4.0	6.7	.6	2.5
1989	2.6	4.2	6.8	.6	2.6
1990	2.6	4.4	7.0	.6	2.8
1991	2.5	4.7	7.2	.6	2.9
1992	2.5	5.0	7.5	.6	3.1
1993	2.5	5.3	7.8	.5	3.1
1994	2.4	5.6	8.0	.5	3.2
1995	2.4	5.9	8.3	.5	3.3
1996	2.3	6.1	8.4	.5	3.4
1997	2.2	6.3	8.5	.5	3.5
1998	2.1	6.5	8.6	.5	3.6

* Source: FAA Statistical Handbook of Aviation

(1) Helicopter hours flown are on a fiscal year basis.

TABLE 20

TOTAL AIRCRAFT OPERATIONS
AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE
(Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL	NUMBER OF FAA TOWERS
<u>Historical*</u>						
1980	10.1	4.6	48.9	2.5	66.2	432
1981	9.5	4.9	44.6	2.5	61.5	433
1982	9.0	5.1	34.2	2.3	50.6	375
1983	9.7	5.9	35.3	2.5	53.3	390
1984	10.9	6.6	36.8	2.4	56.8	403
1985	11.3	6.9	37.2	2.5	57.9	398
1986	12.3	6.9	37.0	2.7	58.9	399
<u>Forecast</u>						
1987	12.8	7.3	37.7	2.7	60.5	399
1988	13.3	7.7	38.6	2.7	62.3	399
1989	13.7	8.1	39.6	2.7	64.1	399
1990	14.1	8.5	40.4	2.7	65.7	399
1991	14.4	8.8	41.4	2.7	67.3	399
1992	14.7	9.1	42.4	2.7	68.9	399
1993	15.0	9.4	43.4	2.7	70.5	399
1994	15.3	9.7	44.6	2.7	72.3	399
1995	15.6	10.0	45.6	2.7	73.9	399
1996	15.8	10.3	46.8	2.7	75.6	399
1997	16.1	10.6	48.0	2.7	77.4	399
1998	16.3	10.9	49.1	2.7	79.0	399

* Source: FAA Air Traffic Activity.

Notes: 1982-1984 operations reflect the temporary closures of FAA Air Traffic Control Towers. Detail may not add to total because of independent rounding.

TABLE 21

ITINERANT AIRCRAFT OPERATIONS
AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE
(Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
<u>Historical*</u>					
1980	10.1	4.6	28.3	1.2	44.2
1981	9.5	4.9	26.4	1.2	42.0
1982	9.0	5.1	20.7	1.1	36.0
1983	9.7	5.9	21.3	1.2	38.0
1984	10.9	6.6	22.2	1.2	41.0
1985	11.3	6.9	22.4	1.3	41.9
1986	12.3	7.0	21.9	1.4	42.6
<u>Forecast</u>					
1987	12.8	7.3	22.3	1.4	43.8
1988	13.3	7.7	22.8	1.4	45.2
1989	13.7	8.1	23.4	1.4	46.6
1990	14.1	8.5	23.9	1.4	47.9
1991	14.4	8.8	24.5	1.4	49.1
1992	14.7	9.1	25.1	1.4	50.3
1993	15.0	9.4	25.7	1.4	51.5
1994	15.3	9.7	26.4	1.4	52.8
1995	15.6	10.0	27.0	1.4	54.0
1996	15.8	10.3	27.7	1.4	55.2
1997	16.1	10.6	28.4	1.4	56.5
1998	16.3	10.9	29.0	1.4	57.6

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of independent rounding.

TABLE 22

LOCAL AIRCRAFT OPERATIONS
AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE
(Millions)

FISCAL YEAR	GENERAL AVIATION	MILITARY	TOTAL
<u>Historical*</u>			
1980	20.6	1.3	21.9
1981	18.2	1.3	19.5
1982	13.5	1.2	14.7
1983	14.0	1.3	15.3
1984	14.6	1.2	15.8
1985	14.8	1.2	16.0
1986E	15.1	1.3	16.4
<u>Forecast</u>			
1987	15.4	1.3	16.7
1988	15.8	1.3	17.1
1989	16.2	1.3	17.5
1990	16.5	1.3	17.8
1991	16.9	1.3	18.2
1992	17.3	1.3	18.6
1993	17.7	1.3	19.0
1994	18.2	1.3	19.5
1995	18.6	1.3	19.9
1996	19.1	1.3	20.4
1997	19.6	1.3	20.9
1998	20.1	1.3	21.4

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of independent rounding.

TABLE 23

INSTRUMENT OPERATIONS
AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE
(Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
<u>Historical*</u>					
1980	10.6	4.1	19.3	4.1	38.2 (10.3)
1981	10.2	4.6	18.5	3.9	37.2 (9.6)
1982	9.5	4.6	13.9	3.6	31.7 (6.5)
1983	10.1	5.3	14.8	3.8	34.0 (7.0)
1984	11.3	6.0	16.0	4.0	37.3 (7.8)
1985	11.8	6.4	16.4	4.1	38.7 (8.0)
1986E	12.7	6.6	16.8	4.3	40.4 (8.4)
<u>Forecast</u>					
1987	13.2	7.0	17.2	4.3	41.7 (9.0)
1988	13.7	7.4	17.6	4.3	43.0 (9.5)
1989	14.1	7.8	18.0	4.3	44.2 (10.3)
1990	14.5	8.2	18.4	4.3	45.4 (11.0)
1991	14.8	8.5	18.8	4.3	46.4 (11.5)
1992	15.1	8.8	19.3	4.3	47.5 (11.5)
1993	15.4	9.1	19.7	4.3	48.5 (11.5)
1994	15.7	9.4	20.2	4.3	49.6 (11.5)
1995	16.0	9.7	20.7	4.3	50.7 (11.5)
1996	16.2	10.0	21.2	4.3	51.7 (11.5)
1997	16.5	10.3	21.7	4.3	52.8 (11.5)
1998	16.7	10.6	22.2	4.3	53.8 (11.5)

* Source: FAA Air Traffic Activity.

Notes: Non-IFR instrument counts at Terminal Control Area (TCA) facilities and expanded area radar service are included in the totals and noted in parenthesis as an information item (see Table 24).

The data include instrument operations at FAA operated military radar approach control facilities. Detail may not add to total because of independent rounding.

TABLE 24

NON-IFR INSTRUMENT OPERATIONS
(Millions)

FISCAL YEAR	TERMINAL CONTROL		EXPANDED RADAR SERVICE AREA		TOTAL
	AREAS		STAGE II, STAGE III, ARSA		
<u>Historical*</u>					
1980	2.7		7.6		10.3
1981	2.8		6.8		9.6
1982	1.9		4.6		6.5
1983	2.3		4.7		7.0
1984	2.4		5.4		7.8
1985	2.0		6.0		8.0
1986E	2.2		6.2		8.4
<u>Forecast</u>					
1987	2.2		6.8		9.0
1988	2.2		7.3		9.5
1989	2.2		8.1		10.3
1990	2.2		8.8		11.0
1991	2.3		9.2		11.5
1992	2.3		9.2		11.5
1993	2.3		9.2		11.5
1994	2.3		9.2		11.5
1995	2.3		9.2		11.5
1996	2.3		9.2		11.5
1997	2.3		9.2		11.5
1998	2.3		9.2		11.5

* Source: FAA Air Traffic Activity.

Notes: 1982-1983 operations reflect the temporary termination of Stage III Service at 34 locations.

TABLE 25

IFR AIRCRAFT HANDLED
AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS
(Millions)

FISCAL YEAR	IFR AIRCRAFT HANDLED				
	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
<u>Historical*</u>					
1980	13.9	2.6	8.9	4.7	30.1
1981	13.0	2.9	9.0	4.7	29.5
1982	12.7	3.3	7.5	4.3	27.9
1983	13.3	3.7	7.8	4.6	29.4
1984	14.1	4.4	8.3	4.9	31.6
1985	14.6	4.8	8.3	5.0	32.7
1986E	16.0	5.0	8.0	5.1	34.1
<u>Forecast</u>					
1987	16.6	5.4	8.3	5.1	35.4
1988	17.2	5.8	8.5	5.1	36.6
1989	17.6	6.2	8.7	5.1	37.6
1990	18.1	6.6	8.9	5.1	38.7
1991	18.5	6.9	9.1	5.1	39.6
1992	18.9	7.3	9.3	5.1	40.6
1993	19.2	7.5	9.5	5.1	41.3
1994	19.6	7.9	9.7	5.1	42.3
1995	20.0	8.1	9.9	5.1	43.1
1996	20.3	8.5	10.1	5.1	44.0
1997	20.7	8.7	10.3	5.1	44.8
1998	20.9	9.1	10.5	5.1	45.6

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of independent rounding.

TABLE 26

IFR DEPARTURES AND OVERS
AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS
(Millions)

FISCAL YEAR	AIR CARRIER		AIR TAXI/COMMUTER		GENERAL AVIATION		MILITARY		TOTAL	
	DEPARTURES	OVERS	DEPARTURES	OVERS	DEPARTURES	OVERS	DEPARTURES	OVERS		
Historical*										
1980	4.9	4.0	1.2	.1	3.9	1.2	1.7	1.4	11.7	6.7
1981	4.6	3.8	1.4	.1	3.9	1.2	1.6	1.4	11.5	6.5
1982	4.4	3.8	1.6	.2	3.2	1.2	1.5	1.3	10.7	6.4
1983	4.7	4.0	1.7	.2	3.3	1.2	1.6	1.4	11.3	6.8
1984	5.0	4.1	2.0	.3	3.5	1.3	1.7	1.4	12.3	7.0
1985	5.2	4.1	2.2	.3	3.5	1.3	1.8	1.4	12.8	7.1
1986E	5.7	4.6	2.3	.4	3.4	1.3	1.8	1.5	13.2	7.8
Forecast										
1987	6.0	4.6	2.5	.4	3.5	1.3	1.8	1.5	13.8	7.8
1988	6.3	4.6	2.7	.4	3.6	1.3	1.8	1.5	14.4	7.8
1989	6.5	4.6	2.9	.4	3.7	1.3	1.8	1.5	14.9	7.8
1990	6.7	4.7	3.1	.4	3.8	1.3	1.8	1.5	15.4	7.9
1991	6.9	4.7	3.2	.5	3.9	1.3	1.8	1.5	15.8	8.0
1992	7.1	4.7	3.4	.5	4.0	1.3	1.8	1.5	16.3	8.0
1993	7.2	4.8	3.5	.5	4.1	1.3	1.8	1.5	16.6	8.1
1994	7.4	4.8	3.7	.5	4.2	1.3	1.8	1.5	17.1	8.1
1995	7.6	4.8	3.8	.5	4.3	1.3	1.8	1.5	17.5	8.1
1996	7.7	4.9	4.0	.5	4.4	1.3	1.8	1.5	17.9	8.2
1997	7.9	4.9	4.1	.5	4.5	1.3	1.8	1.5	18.3	8.2
1998	8.0	4.9	4.3	.5	4.6	1.3	1.8	1.5	18.7	8.2

* Source: FAA Air Traffic Activity.

TABLE 27

TOTAL FLIGHT SERVICES
AT FAA FLIGHT SERVICE STATIONS AND COMBINED STATIONS/TOWERS
(Millions)

FISCAL YEAR	FLIGHT PLANS ORIGINATED	PILOT BRIEFS	AIRCRAFT CONTACTED	FLIGHT SERVICES	TOTAL
<u>Historical*</u>					
1980	9.0	18.3	9.6		64.2
1981	8.8	17.7	9.6		62.6
1982	8.5	17.8	9.7		62.4
1983	8.1	16.0	8.6		56.9
1984	8.2	15.1	8.1		54.7
1985	8.0	14.6	7.7		52.9
1986E	7.5	13.4	7.2		49.0
<u>Forecast</u>					
1987	7.4	13.0	7.0		47.8
1988	7.5	12.8	7.0		47.6
1989	7.6	13.0	7.1		48.3
1990	7.8	13.3	7.1		49.3
1991	8.0	13.5	7.2		50.2
1992	8.2	13.7	7.2		51.0
1993	8.4	13.9	7.2		51.8
1994	8.6	14.0	7.3		52.5
1995	8.8	14.1	7.4		53.2
1996	9.0	14.2	7.4		53.8
1997	9.2	14.3	7.5		54.5
1998	9.4	14.4	7.5		55.1

* Source: FAA Air Traffic Activity.

Notes: Total flight services is equal to the sum of flight plans originated and pilot briefs, multiplied by two, plus the number of aircraft contacted.

TABLE 28

FLIGHT PLANS ORIGINATED
AT FAA FLIGHT SERVICE STATIONS AND COMBINED STATIONS/TOWERS
(Millions)

FISCAL YEAR	FLIGHT PLANS ORIGINATED		
	IFR-DVFR	VFR	TOTAL
<u>Historical*</u>			
1980	6.6	2.4	9.0
1981	6.5	2.3	8.8
1982	6.5	2.0	8.5
1983	6.3	1.9	8.1
1984	6.4	1.8	8.2
1985	6.3	1.7	8.0
1986E	5.9	1.6	7.5
<u>Forecast</u>			
1987	5.9	1.5	7.4
1988	5.9	1.6	7.5
1989	6.0	1.6	7.6
1990	6.1	1.7	7.8
1991	6.3	1.7	8.0
1992	6.4	1.8	8.2
1993	6.6	1.8	8.4
1994	6.7	1.9	8.6
1995	6.9	1.9	8.8
1996	7.1	1.9	9.0
1997	7.3	1.9	9.2
1998	7.4	2.0	9.4

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of independent rounding.

TABLE 29

AIRCRAFT CONTACTED
AT FAA FLIGHT SERVICE STATIONS AND COMBINED STATIONS/TOWERS
(Millions)

FISCAL YEAR	USER CATEGORY					FLIGHT RULES		
	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL		MILITARY	IFR-DVFR		TOTAL
			AVIATION			IFR	VFR	
<u>Historical*</u>								
1980	.4	.9	7.9		.4	2.0	7.7	9.6
1981	.4	.9	7.9		.4	2.0	7.6	9.6
1982	.4	1.2	7.7		.4	2.5	7.2	9.7
1983	.4	1.1	6.6		.4	2.3	6.3	8.6
1984	.4	1.1	6.3		.4	2.3	5.9	8.1
1985	.4	1.1	5.8		.4	2.2	5.5	7.7
1986E	.4	1.0	5.4		.4	2.1	5.1	7.2
<u>Forecast</u>								
1987	.4	1.1	5.1		.4	2.1	4.9	7.0
1988	.3	1.2	5.1		.4	2.1	4.9	7.0
1989	.3	1.2	5.2		.4	2.1	5.0	7.1
1990	.3	1.2	5.2		.4	2.1	5.0	7.1
1991	.3	1.2	5.3		.4	2.2	5.0	7.2
1992	.3	1.2	5.3		.4	2.2	5.0	7.2
1993	.3	1.2	5.3		.4	2.2	5.0	7.2
1994	.3	1.2	5.4		.4	2.2	5.1	7.3
1995	.3	1.2	5.5		.4	2.3	5.1	7.4
1996	.3	1.2	5.5		.4	2.3	5.1	7.4
1997	.3	1.2	5.6		.4	2.4	5.1	7.5
1998	.3	1.2	5.6		.4	2.4	5.1	7.5

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of independent rounding.

TABLE 30

ACTIVE U.S. MILITARY AIRCRAFT
IN THE CONTINENTAL UNITED STATES (1)

FISCAL YEAR	FIXEL WING AIRCRAFT				TOTAL
	JET	TURBOPROP	PISTON	HELICOPTER	
Historical*					
1980	8,794	1,869	699	7,607	18,969
1981	9,111	1,943	591	7,718	19,363
1982	9,647	1,900	516	9,665	21,728
1983	9,495	1,745	363	7,049	18,652
1984	9,551	1,777	333	7,172	18,833
1985	9,640	1,881	408	7,404	19,332
1986E	9,732	1,814	384	8,243	20,173
Forecast					
1987	9,817	1,871	373	8,471	20,532
1988	9,896	1,896	366	8,599	20,757
1989	9,980	1,920	362	8,822	21,084
1990	10,018	1,937	358	8,935	21,248
1991	10,024	1,915	357	9,222	21,518
1992	10,204	1,960	355	9,255	21,774
1993	10,449	1,977	348	9,295	22,069
1994	10,488	1,991	349	9,512	22,140
1995(2)	10,488	1,991	349	9,312	22,140
1996	10,488	1,991	349	9,312	22,140
1997	10,488	1,991	349	9,312	22,140
1998	10,488	1,991	349	9,312	22,140

* Source: Office of the Secretary of Defense, Department of Defense.

(1) Includes Army, Air Force, Navy and Marine regular service aircraft, as well as Reserve and National Guard aircraft.

(2) Detail planning information not available beyond 1994. Fiscal Years 1995-1998 projected at 1994 level.

TABLE 31

ACTIVE U.S. MILITARY AIRCRAFT
HOURS FLOWN IN THE CONTINENTAL UNITED STATES (1)
(Thousands)

FISCAL YEAR	FIXED WING AIRCRAFT			HELICOPTER	TOTAL
	JET	TURBOPROP	PISTON		
<u>Historical*</u>					
1980	2,904	796	235	1,320	5,255
1981	2,966	840	253	1,791	5,850
1982	3,347	762	192	1,876	6,177
1983	3,345	746	119	1,557	5,767
1984	3,389	761	120	1,605	5,875
1985	3,350	739	126	1,567	5,782
1986E	3,500	835	157	1,815	6,307
<u>Forecast</u>					
1987	3,395	786	148	1,907	6,236
1988	3,441	784	145	1,906	6,276
1989	3,462	792	143	1,957	6,354
1990	3,480	804	141	1,991	6,416
1991	3,502	806	140	2,094	6,542
1992	3,556	812	137	2,159	6,664
1993	3,577	816	137	2,159	6,689
1994	4,001	816	137	2,159	7,113
1995(2)	4,001	816	137	2,159	7,113
1996	4,001	816	137	2,159	7,113
1997	4,001	816	137	2,159	7,113
1998	4,001	816	137	2,159	7,113

* Source: Office of the Secretary of Defense, Department of Defense.

(1) Includes Army, Air Force, Navy and Marine regular service aircraft, as well as Reserve and National Guard aircraft.

(2) Detail planning information not available beyond 1994. Fiscal Years 1995-1998 projected at 1994 level.

GLOSSARY OF TERMS

Air Carrier Operations -- Arrivals and departures performed by air carriers certificated in accordance with FAR Parts 121 and 127.

Air Route Traffic Control Center (ARTCC) -- A facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance service may be provided to VFR aircraft.

Air Taxi -- An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operate small aircraft "for hire" for specific trips.

Air Traffic -- Aircraft operating in the air or on an airport surface, exclusive of loading ramps and parking areas.

Air Traffic Hub -- Air traffic hubs are not airports; they are the cities and Metropolitan Statistical Areas requiring aviation services and may include more than one airport. Communities fall into four classes as determined by each community's percentage of the total enplaned passengers by scheduled air carriers in the 50 United States, the District of Columbia, and other U.S. areas designated by the Federal Aviation Administration.

1. Large: 1.00 percent (3,633,415 passengers and over in CY 1985).
2. Medium: 0.25 percent to 0.999 percent (between 908,354 and 3,633,414 passengers in CY 1985).
3. Small: 0.05 percent to 0.249 percent (between 181,671 and 908,353 passengers in CY 1985).
4. Nonhub: Less than 0.05 percent (under 181,671 passengers in CY 1985)

Air Travel Club -- An operator certificated in accordance with FAR Part 123 to engage in the carriage of members who are qualified for that carriage by payment of an assessment, dues, membership fees, or other similar remittance.

Aircraft Contacted -- Aircraft with which the flight service stations have established radio communications contact. One count is made for each en route landing or departing aircraft contacted by a flight service station, regardless of the number of contacts made with an individual aircraft during the same flight. A flight contacting five FSSs would be counted as five aircraft contacted.

Aircraft Handled -- See IFR AIRCRAFT HANDLED.

Aircraft Operations -- The airborne movement of aircraft in controlled or noncontrolled airport terminal areas, and counts at en route fixes or other points where counts can be made. There are two types of operations: local and itinerant.

1. LOCAL OPERATIONS are performed by aircraft which:
 - (a) operate in the local traffic pattern or within sight of the airport;
 - (b) are known to be departing for, or arriving from flights in local practice areas located within a 20-mile radius of the airport;
 - (c) execute simulated instrument approaches or low passes at the airport.
2. ITINERANT OPERATIONS are all aircraft operations other than local operations.

Airport Advisory Service -- A service provided by flight service stations at airports not served by a control tower. This service provides information to arriving and departing aircraft concerning wind direction/speed, favored runway, altimeter setting, pertinent-known traffic/field conditions, airport taxi routes/traffic patterns, and authorized instrument approach procedures. This information is advisory in nature and does not constitute an ATC clearance.

Airport Traffic Control Tower -- A terminal facility which through the use of air/ground communications, visual signaling, and other devices, provides ATC services to airborne aircraft operating in the vicinity of an airport and to aircraft operating on the movement area.

All-Cargo Carrier -- An air carrier certificated in accordance with FAR Part 121 to provide scheduled air freight, express, and mail transportation over specified routes, as well as the conduct of nonscheduled operations which may include passengers.

Approach Control Facility -- A terminal air traffic control facility providing approach control service.

Approach Control Service -- Air traffic control service provided by an approach control facility for arriving and departing VFR/IFR aircraft and, on occasion, en route aircraft. At some airports not served by an approach control facility, the ARTCC provides limited approach control service.

ARTCC -- See AIR ROUTE TRAFFIC CONTROL CENTER.

ASMs -- See AVAILABLE SEAT MILES.

Available Seat Miles (ASMs) -- The aircraft miles flown in each flight stage multiplied by the number of seats available on that stage for revenue passenger use.

Business Transportation -- Any use of an aircraft not for compensation or hire by an individual for the transportation required by a business in which he is engaged.

Center -- See AIR ROUTE TRAFFIC CONTROL CENTER.

Center Area -- The specified airspace within which an air route traffic control center (ARTCC) provides air traffic control and advisory service.

Center Radar Approach Control (CERAP) -- A combined air route traffic control center (ARTCC) and a terminal approach control facility (TRACON).

CERAP -- See CENTER RADAR APPROACH CONTROL.

Commercial Air Carriers -- An air carrier certificated in accordance with FAR Parts 121 or 127 to conduct scheduled services on specified routes. These air carriers may also provide nonscheduled or charter services as a secondary operation. Four carrier groupings have been designated for statistical and financial data aggregation and analysis.

1. MAJORS: Air carriers with annual operating revenues greater than \$1 billion.
2. NATIONALS: Air carriers with annual operating revenues of between \$100 million, and \$1 billion.
3. LARGE REGIONALS: Air carriers with annual operating revenues of between \$10 million and \$99,999,999.
4. MEDIUM REGIONALS: Air carriers with annual operating revenues of less than \$10 million.

Common IFR Room -- A highly automated terminal radar control facility. It provides terminal radar service in an area encompassing more than one major airport which accommodates instrument flight operations.

Commuter Air Carrier -- An air carrier certificated in accordance with FAR Part 135 which operates aircraft with a maximum of 60 seats, and provides at least five scheduled round trips per week between two or more points, or carries mail.

Commuter/Air Taxi Operations -- Those arrivals and departures performed by air carriers certificated in accordance with FAR Part 135.

Control Tower -- See AIRPORT TRAFFIC CONTROL TOWER.

Domestic Operations -- All air carrier operations having destinations within the 50 United States, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands.

Executive Transportation -- Any use of an aircraft by a corporation, company or other organization for the purpose of transporting its employees and/or property not for compensation or hire, and employing professional pilots for the operation of the aircraft.

FAA -- Federal Aviation Administration.

Facility -- See AIR TRAFFIC CONTROL FACILITY.

Flight Plan -- Specified information relating to the intended flight of an aircraft that is filed orally or in writing with a flight service station or an air traffic control facility.

Flight Service Station (FSS) -- Air Traffic Service facilities within the National Airspace System which provide preflight pilot briefings and en route communications with IFR flights; assist lost IFR/VFR aircraft; assist aircraft having emergencies; relay ATC clearances, originate, classify, and disseminate Notices to Airmen; broadcast aviation weather and NAS information; receive and close flight plans; monitor radio NAVAIDS; notify search and rescue units of missing VFR aircraft; and operate the national weather teletypewriter systems. In addition, at selected locations, FSSs take weather observations, issue airport advisories, administer airmen written examinations, and advise Customs and Immigration of transborder flights.

Flight Services -- See TOTAL FLIGHT SERVICES.

Foreign Flag Air Carrier -- An air carrier other than a U.S. flag air carrier in international air transportation. "Foreign air carrier" is a more inclusive term than "foreign flag air carrier," presumably including those non-U.S. air carriers operating solely within their own domestic boundaries. In practice, the two terms are used interchangeably.

FSS -- See FLIGHT SERVICE STATION.

General Aviation -- All civil aviation activity except that of air carriers certificated in accordance with FAR Parts 121, 123, 127, and 135. The types of aircraft used in general aviation (GA) activities cover a wide spectrum from corporate multi-engine jet aircraft piloted by professional crews to amateur-built single-engine piston acrobatic planes, balloons, and dirigibles.

General Aviation Operations -- Arrivals and departures of all civil aircraft, except those classified as air carrier and commuter/air taxi.

Hub -- See AIR TRAFFIC HUB.

IFR -- See INSTRUMENT FLIGHT RULES.

IFR Aircraft Handled -- The number of IFR departures multiplied by two, plus the number of IFR overs. This definition assumes that the number of departures (acceptances, extensions and originations of IFR flight plans) is equal to the number of landings (IFR flight plans closed).

IFR Departures -- An IFR departure includes IFR flights that:

1. originated in a Center's area;
2. are extended by the Center; or
3. are accepted by the Center under SOLE EN ROUTE clearance procedures.

IFR Overs -- An IFR flight that originates outside the ARTCC area and passes through the area without landing.

IFSS -- See INTERNATIONAL FLIGHT SERVICE STATION.

International and Territorial Operations -- The operation of aircraft flying between the 50 United States and foreign points, between the 50 United States and U.S. possessions and territories, and between two foreign points. Includes both the combination passenger/cargo and the all-cargo carriers engaged in international and territorial operations.

Instructional Flying -- Any use of aircraft for the purpose of formal instruction with the flight instructor aboard or with the maneuvers on the particular flight(s) specified by the flight instructor.

Instrument Approach -- A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority (FAR Part 91).

Instrument Flight Rules (IFR) -- Rules governing the procedures for conducting instrument flight.

Instrument Operation -- An aircraft operation in accordance with an IFR flight plan or an operation where IFR separation between aircraft is provided by a terminal control facility or air route traffic control center.

International Flight Service Station (IFSS) -- A central operations facility in the flight advisory system, manned and equipped to control aeronautical point-to-point telecommunications, and air/ground telecommunications with pilots operating over international territory or waters, providing flight plan following, weather information, search and rescue action, and other flight assistance operations.

Itinerant Operations -- See AIRCRAFT OPERATIONS.

Large Regionals -- See COMMERCIAL AIR CARRIERS.

Local Operations -- See AIRCRAFT OPERATIONS.

Majors -- See COMMERCIAL AIR CARRIERS.

Medium Regionals -- See COMMERCIAL AIR CARRIERS.

Military Operations -- All arrivals and departures performed by aircraft not classified as civil.

Nationals -- See COMMERCIAL AIR CARRIERS.

Personal/Pleasure Flying -- Any use of an aircraft for personal purposes not associated with a business or profession, and not for hire. This includes maintenance of pilot proficiency.

Pilot Briefing -- A service provided by the Flight Service Station to assist pilots in flight planning. Briefing items may include weather information NOTAMS, military activities, flow control information, and other items as requested.

Radar Air Traffic Control Facility (RATCF) -- An air traffic control facility, located at a U.S. Navy (USN) or Marine Corps (USMC) Air Station, utilizing surveillance and, normally, precision approach radar and air/ground communication equipment to provide approach control services to aircraft arriving, departing, and transiting the airspace controlled by the facility. The facility may be operated by the FAA, the USN and the FAA, the USN, or the USMC. Service may be provided to both civil and military airports.

Radar Approach Control (RAPCON) -- An air traffic control facility, located at a U.S. Air Force (USAF) Base, utilizing surveillance and, normally, precision approach radar and air/ground communication equipment to provide approach control services to aircraft arriving, departing, and transiting the airspace controlled by the facility. The facility may be operated by the FAA, or the USAF. Service may be provided to both civil and military airports.

Radio Contacts -- The initial radio call-up to a flight service station by en route aircraft; a complete interchange of information and a termination of the contact.

RAPCON -- See RADAR APPROACH CONTROL.

RARCF -- See RADAR AIR TRAFFIC CONTROL FACILITY.

Registered Active General Aviation Aircraft -- A civil aircraft registered with the FAA that has been flown one or more hours during the previous calendar year. Excluded are aircraft owned and operated in regularly scheduled, nonscheduled, or charter service by commercial air carriers or aircraft in excess of 12,500 pounds maximum gross takeoff weight, and owned and operated by a commercial operator certificated by the FAA to engage in intrastate common carriage.

Revenue Passenger Enplanements -- The total number of passengers boarding aircraft. This includes both originating and connecting passengers.

Revenue Passenger Load Factor -- Revenue passenger-miles as a percent of available seat-miles in revenue passenger services, i.e., the proportion of aircraft seating capacity that is actually sold and utilized.

Revenue Passenger Mile (RPM) -- One revenue passenger transported one mile in revenue service. Revenue passenger-miles are computed by summation of the products of the revenue aircraft miles flown on each inter-airport hop multiplied by the number of revenue passengers carried on that hop.

Revenue Ton Mile (RTM) -- One ton of revenue traffic transported one mile.

RPM -- See REVENUE PASSENGER MILE.

RSPA -- The Research and Special Programs Administration of the U.S. Department of Transportation. This office is responsible for the collection of air carrier traffic and financial data on Form 41 that was formally collected by the Civil Aeronautics Board.

RTM -- See REVENUE TON MILE.

Secondary Airport -- An airport receiving approach control service as a satellite to a primary approach control facility, or one at which control is exercised by the approach control facility under tower en route control procedure.

Supplemental Air Carrier -- An air carrier certificated in accordance with FAR Part 121, and providing nonscheduled or supplemental carriage of passengers or cargo, or both, in air transportation. They are also referred to as nonscheduled or charter air carriers.

Terminal Radar Approach Control (TRACON) -- An FAA traffic control facility using radar and air/ground communications to provide approach control services to aircraft arriving, departing, or transiting the airspace controlled by the facility. Service may be provided to both civil and military airports. A TRACON is similar to a RAPCON (USAF), RATCF (USN), and ARAC (Army).

Total Flight Services -- The sum of flight plans originated and pilot briefs, multiplied by two, plus the number of aircraft contacted. No credit is allowed for airport advisories.

Total Operations -- All arrivals and departures performed by military, general aviation, commuter/air taxi, and air carrier aircraft.

Tower -- See AIRPORT TRAFFIC CONTROL TOWER.

TRACON -- See TERMINAL RADAR APPROACH CONTROL.

U.S. Flag Carrier -- One of a class of air carriers holding a certificate issued by the Department of Transportation, and approved by the President, authorizing the carrier to provide scheduled operations over a specified route between the U.S. (and/or its territories) and one or more foreign countries.

VFR -- See VISUAL FLIGHT RULES.

VFR Tower -- An airport traffic control tower that does not provide approach control service.

Visual Flight Rules (VFR) -- Rules that govern the procedures for conducting flight under visual conditions. The term "VFR" is also used in the U.S. to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

Appendix A

ACTIVE U.S. COMMERCIAL AIR CARRIERS

Air Carrier	Carrier Type (1)	Carrier Grouping (2)	Date of First Reported Traffic (3)	
			Domestic	International
1. Aerial (AG)	F	MR	12-84	8-84
2. Air Atlanta (CC)	S	LR	2-84	
3. AirCal (OC)	S	N	1-79	
4. Air Express	F	MR		4-83
5. Air Hawaii	S	MR	11-85	
6. Air Wisconsin (ZW)	S	N	7-79	
7. Alaska (AS)	S	N	X	
8. Aloha (AQ) (4)	S	N	X	6-84
9. American (AA)	S	M	X	X
10. America West (HP)	S	N	8-83	
11. American Trans Air	C	LR	X	X
12. Arrow (JW)	S	LR	11-82	6-83
13. Aspen (AP) (5)	S	LR	1-85	
14. Atlantic Gulf (ZY)	C	MR	9-85	
15. Braniff (BN) (6)	S	N	3-84	
16. Britt (RU) (7)	S	LR	10-84	
17. Buffalo	C	LR	4-84	4-84
18. Challenge Air Cargo	F	MR		7-86
19. Challenge Air Int'l.	S	MR		7-86
20. Continental (CO)	S	M	X	X
21. Delta (DL)	S	M	X	X
22. Eastern (EA)	S	M	X	X
23. Emerald (OD)	S	LR	7-82	
24. Evergreen (JO)	F	LR	X	X
25. Federal Express (FM)	F	M	1-86	1-86
26. Florida Express (ZO)	S	LR	1-84	
27. Flying Tiger (FT)	F	M	X	X
28. Galaxy (GY)	C	MR	10-83	12-83
29. Great American (FD)	C	MR	10-80	
30. Gulf Air Transport (GA)	C	MR		1-85

Air Carrier	Carrier Type (1)	Carrier Grouping (2)	Date of First Reported Traffic (3)	
			Domestic	International
31. Hawaiian (HA)	S	N	X	10-84
32. Horizon Air (QX)	S	LR	9-84	
33. Independent Air	S	MR	9-94	9-84
34. Interstate	F	LR	5-85	5-85
35. Jet America (SI)	S	N	1-82	
36. Jet East	C	MR	1-85	
37. Jet Fleet (JL)	C	MR	6-83	
38. Key	C	LR	6-84	1-85
39. McClain (MU)	S	LR	11-86	
40. Markair (BF) (8)	S	LR	X	
41. Midway (ML)	S	N	11-79	
42. Mid Pacific (HO)	S	LR	10-85	
43. Midwest Express (YX)	S	LR	7-84	
44. Million	C	MR		1-86
45. New York Air (NY)	S	N	12-80	
46. Northern Air Cargo (HU)	F	LR	12-82	
47. Northwest (NW) (9)	S	M	X	X
48. Pacific Interstate (QT)	S	LR	12-84	
49. Pacific Southwest (PS)	S	N	1-79	
50. Pan American (PA)	S	M	X	X
51. People Express (PE)	S	N	5-81	5-83
52. Piedmont (PI) (10)	S	M	X	
53. Pilgrim (PM)	S	LR	9-85	
54. Ports of Call Travel Club	C	LR	9-85	
55. Presidential Air (XV)	S	LR	10-85	
56. Reeve (RV)	S	LR	X	
57. Rich (XR)	C	MR	1-82	
58. Rosenbalm	F	MR	4-85	4-85
59. Skybus (FW)	S	MR	7-85	
60. Skystar	C	MR	1-85	3-85
61. Sky World	C	LR	10-85	10-85
62. Southern Air	F	LR	5-80	4-80
63. South Pacific Island (HK)	S	LR		7-81
64. Southwest (WN)	S	N	2-79	
65. Sun Country (SC)	C	MR	1-83	3-83

<u>Air Carrier</u>	<u>Carrier Type (1)</u>	<u>Carrier Grouping (2)</u>	<u>Date of First Reported Traffic (3)</u>	
			<u>Domestic</u>	<u>International</u>
66. Sunworld (JK)	S	LR	5-83	
67. Total Air (TA)	C	MR	10-84	5-85
68. Tower (FF)	S	LR		11-83
69. Trans Air-Link	F	MR	1-84	1-84
70. Trans International	F	MR	5-85	1-85
71. Transtar (MA) (11)	S	LR	8-81	
72. Trans World (TW) (12)	S	M	X	X
73. United (UA)	S	M	X	4-83
74. US Air (AL)	S	M	X	
75. Western (WA)	S	M	X	X
76. Zantop	F	LR	X	X

(1) S = Scheduled; C = Charter; F = All-Cargo.

(2) M = Majors; N = Nationals; LR = Large Regionals; MR = Medium Regionals.

(3) Date of first reported traffic is indicated for those carriers starting service since the passage of the Airline Deregulation Act of 1978. Traffic reported by those carriers certificated prior to deregulation indicated by an X.

(4) Discontinued international service 1/85.

(5) Carrier reported as a commuter air carrier from 9/82 to 12/84.

(6) Carrier did not operate from 5/82 to 2/84.

(7) Carrier reported as a commuter air carrier from 9/81 to 9/84.

(8) Formerly Alaska International.

(9) Merged with Republic Airlines.

(10) Merged with Empire Airlines.

(11) Formerly Muse Airlines.

(12) Merged with Ozark Airlines.

Appendix B

CARRIERS NO LONGER INCLUDED IN AIR CARRIER FORECASTS

Air Carrier	Carrier Type (1)	Carrier Grouping (2)	Date of First Reported Traffic (3)		Date of Last Reported Traffic (4)
			Domestic	Int'l.	
1. Aeromech (KC)	S	MR	7-79		5-81**
2. Air Florida (QH)	S	N	1-79	7-80	5-84*
3. Air Illinois (UX)	S	LR	1-83		2-84*
4. Airlift (RD)	C	MR	7-84	7-84	12-85*
5. Airmark	C	MR	8-84	9-84	12-84*
6. Air Midwest (ZV)	S	LR	X		12-84**
7. Air National (AH)	C	LR		4-84	6-84*
8. Air Nevada (LW)	S	MR	4-81		7-82**
9. Air New England (NE)	S	MR	X		10-81*
10. Air North (NO)	S	MR	6-80		8-82**
11. Air North/Nenana (XG)	S	MR	3-81		8-82**
12. Air One (CB)	S	LR	4-83		7-84*
13. AirPac (RI)	S	LR	4-84		12-85*
14. All Star (LS)	S	MR	4-83	4-83	10-85*
15. Altair (AK)	S	MR	1-79		9-82*
16. American Int'l. (AV)	S	LR	11-82		9-84*
17. Apollo (ID)	S	MR	5-79		7-81**
18. Arista (RI)	C	MR	12-82	8-82	3-84*
19. Best (IW)	S	MR	7-82		10-85**
20. Big Sky (GQ)	S	MR	6-79		9-82**
21. Blue Bell (BB)	C	MR	6-83		2-84*
22. Cascade (CZ)	S	LR	1-85		11-85*
23. Capitol (CL)	S	N	7-80	7-81	9-84*
24. Challenge (CN)	F	MR		8-82	6-86*
25. Cochise (DP)	S	MR	1-79		12-81*
26. Coleman (CH)	S	MR	9-79		3-80*
27. Colgan (CJ)	S	MR	4-81		3-83**
28. Empire (UR)	S	LR	10-79		4-86*
29. Five Star	C	LR	12-85	12-85	4-86*
30. Flight International	C	MR	4-84	6-84	9-85*

Air Carrier	Carrier Type (1)	Carrier Grouping (2)	Date of First Reported Traffic (3)		Date of Last Reported Traffic (4)
			Domestic	Int'l.	
31. Frontier (FL)	S	N	X	X	8-86*
32. Frontier Horizon (FH)	S	LR	1-84		1-85*
33. Global (GL)	C	LR	X	X	12-84*
34. Golden Gate (GG)	S	MR	5-80		7-81*
35. Golden West (GW)	S	MR	2-79		7-82**
36. Guy America (HX)	S	MR		8-81	2-83*
37. Hawaii Express (LP)	S	LR	10-82		10-83*
38. Imperial (II)	S	MR	1-80		6-82**
39. Int'l. Air Service (IE)	C	LR	11-83		5-85*
40. Jet Charter	C	MR	7-82	7-82	5-85*
41. Kodiak (KO)	S	MR	X		11-82**
42. L.A.B. (JF)	S	MR	1-82		8-82**
43. Mid-South (VL)	S	MR	6-80		2-84*
44. Midstate (IU)	S	MR	7-81		7-82**
45. Midway Express	S	LR	10-84		7-85*
46. Mississippi Valley (XV)	S	MR	4-79		8-82**
47. Munz (XY)	S	MR	X		8-83*
48. New Air (NC)	S	MR	5-79		9-82**
49. New Wien (WC)	S	MR	9-85		10-85*
50. Northeastern (QS)	S	LR	7-84		2-85*
51. Overseas (OV)	C	LR	10-82		10-85*
52. Ozark (OZ)	S	N	X		9-86*
53. Pacific East (PR)	S	LR	9-82		3-84*
54. Pacific Express (VB)	S	LR	2-82		10-83*
55. Peninsula (KS)	S	MR	1-82		1-83**
56. Pride Air (NI)	S	LR	10-85		11-85*
57. Republic (RC)	S	M	X		9-86*
58. Rocky Mountain (JC)	S	MR	7-81		9-82**
59. Royale (OQ)	S	LR	3-84		6-84**
60. Ryan	C	LR	4-84	4-84	5-86*
61. Sea Airmotive (KJ)	S	MR	1-80		6-82**
62. Sky West (QG)	S	MR	7-79		12-84**
63. Samoa (MB)	S	MR		2-85	6-85*
64. Southeast (NS)	S	MR	7-79		1-80*
65. Swift Aire (WI)	S	MR	1-79		7-81*

<u>Air Carrier</u>	<u>Carrier Type (1)</u>	<u>Carrier Grouping (2)</u>	<u>Date of First Reported Traffic (3)</u>		<u>Date of Last Reported Traffic (4)</u>
			<u>Domestic</u>	<u>Int'l.</u>	
66. T-Bird (DQ)	C	MR		4-82	8-84*
67. Transamerica (TV)	S	N		5-79	9-86*
68. Wien (WC)	S	N	X		11-84*
69. Western Yukon (WX)	S	MR	7-81		6-82*
70. World (WO)	C	N	7-80	5-81	9-86*
71. Worldwide	C	MR	10-84	10-84	3-86*
72. Wright (FW)	S	MR	X		11-82**

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(2) M = Majors; N = Nationals; LR = Large Regionals; MR = Medium Regionals.

(3) Date of first reported traffic is indicated for those carriers starting service since the passage of the Airline Deregulation Act of 1978. Traffic reported by those carriers certificated prior to deregulation indicated by an X.

(4) Date of last reported traffic is indicated. Carriers that have discontinued scheduled passenger service indicated by an *. Carriers now filing RSPA Form 298-C in lieu of RSPA Form 41 indicated by **.

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